DEPARTMENT OF THE ARMY
U. S. ARMY ENVIRONMENTAL HYGIENE AGENCY
ABERDEEN PROVING GROUND, MARYLAND 21010-5422

REPLY TO ATTENTION OF

HSHB-ML-T (40)

15 AUG 1994

MEMORANDUM FOR RECORD

SUBJECT: Toxicological Study No. 75-51-YJ81-93, 4-Amino 2-Nitrotoluene (4A2NT) OralApproximate Lethal Dose 14-Day Range Finding and 90-Day Subchronic Feeding Studies in Rats, August 1991 - November 1993

Copies of report with Executive Summary are enclosed.

FOR THE COMMANDER:

Encl

MAURICE H. WEEKS
Chief, Toxicology Division

USAEHA

U.S. Army Environmental Hygiene Agency

TOXICOLOGICAL STUDY NO. 75-51-YJ81-93
4-AMINO 2-NITROTOLUENE (4A2NT)
ORAL APPROXIMATE LETHAL DOSE
14-DAY RANGE FINDING AND 90-DAY
SUBCHRONIC FEEDING STUDIES
IN RATS
AUGUST 1991 - NOVEMBER 1993

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The subchronic study examined the toxicity of 4-Amino 2-Nitroluene (4A2NT) in rats following oral administration in feed for 90 days. Associated with the administration of 4A2NT in rats was testicular hypospermatogenesis (atrophy) a higher incidence of cardiomyopathy, anemia and a high incidence of hecatocellular cytoplasmic vacvoliztion. A no observed adverse effect level in the 90-day study was not established. The lowest-observed-adverse-effect-level in the 90-day study was 27 mg/kg/day for males and 32 mg/kg/day for females.

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REPLY TO
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EXECUTIVE SUMMARY
TOXICOLOGICAL STUDY NO. 75-51-YJ81-93
4-AMINO 2-NITROTOLUENE (4A2NT)
ORAL APPROXIMATE LETHAL DOSE
14-DAY RANGE FINDING AND 90-DAY
SUBCHRONIC FEEDING STUDIES
IN RATS
AUGUST 1991 - NOVEMBER 1993

1. PURPOSE. The oral approximate lethal dose study was conducted to determine an approximate dosage range at which to begin the 14-day range finding feeding study. The 14-day feeding study served as a range finding study to determine the dosages used in the subsequent subchronic feeding study. The subchronic study was conducted to determine the toxic effects associated with the continuous oral exposure of 4A2NT in rats over a period of 90 days and to establish a no-observed-adverse-effect-level (NOAEL).

2. CONCLUSIONS. The oral approximate lethal dose for 4A2NT in both sexes was 5000 mg/Kg. The 14-day range finding study suggested a probable compound related effect in the 2000 ppm (high dose) exposure groups of both sexes and a possible compound related effect in the 1000 ppm (middle dose) exposure groups of both sexes. An NOAEL was not established for the 90-day subchronic study. The lowest dosage levels in this study were 27 mg/Kg/day for males and 32 mg/Kg/day for females. A lowest-observed-adverse-effect-level of 27 mg/Kg/day for males and 32 mg/Kg/day for females was established.

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TOXICOLOGICAL STUDY NO. 75-51-YJ81-93
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14-DAY RANGE FINDING AND 90-DAY
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1. REFERENCES. See Appendix A.

2. PURPOSE.

a. The oral approximate lethal dose study was conducted to determine an approximate dosage range at which to begin the 14-day range finding feeding study.

b. The 14-day feeding study served as a range finding study to determine the dosages used in the subsequent subchronic feeding study.

c. The subchronic study was designed to determine the toxic effects associated with the contiuous oral exposure of 4-amino 2-nitrotoluene (4A2NT) in rats over a period of 90 days and to establish a no-observed-adverse-effect-level (NOAEL).

3. GENERAL. 4-amino-2-nitrotoluene is a photolytic metabolite of 2,4-dinitrotoluene (2,4-DNT). The 4A2NT is a potential contaminant at army ammunition plants and depots which are historically associated with 2,4-DNT. Little toxicity data is available and these studies were conducted to provide basic information on the potential toxicity of this material. This information will be used to predict the probable risk to human health posed by this compound.

4. MATERIALS.

a. Test Substance. The test substance, 4A2NT, was purchased from the Aldridge Chemical Co., Inc., 1001 W. Paul Ave., Milwaukee, Wisconsin. It was a rust colored powder with little, if any odor. It is listed in registry of toxic effects as CAS No. 119-32-4. One lot (07006BX) of 4A2NT 97 percent was received containing 2475 grams. A sample was analyzed by the Organic Environmental Chemistry Division, U.S. Army Environmental Hygiene Agency (USAEHA), using infrared spectroscopy and gas chromotography (GC). The analysis was a comparison of spectrum with literature and GC. the IR spectrum is similar to that reported by Aldridge with differences due to sampling techniques.

b. Animals. All studies were conducted using male and female Sprague-Dawley rats obtained from the Charles River Laboratories, Wilmington, Massachusetts. The animals were examined by the divisions' veterinarians and found to be in acceptable health. The male rats had a weight range of 198-231g and the female rats had a weight range of 127-176g. The animals were quarantined for a 1-week period. Drinking quality water and Purina Certified Rodent Chow 5002® were available ad libitum.

5. METHODS.

a. Acute Oral Toxicity. An approximate lethal dose (ALD) study was performed to determine the lethality occuring within 14 days following a single oral dose of a 4A2NT. The chemical was suspended in polyethylene glycol 200 (PEG 200) at a concentration of 800 mg/mL. Single oral graduated doses of 7500 mg/Kg, 500 mg/Kg, 3333 mg/Kg, 2222 mg/Kg, 1480 mg/Kg, and 987 mg/Kg were given by gavage to male and female rats. A 14-day observation period was used to observe death or clinical signs. Animals were weighed at 1, 3, 7, and 14-day intervals after exposure. All survivors were euthanized at 14 days and submitted for gross pathological examination. The ALD of the test substance is considered to be the lowest dose that causes death (with none living at higher doses and no deaths at lower doses) during the 14-day observation period.

b. 14-Day Feeding Study.

(1) A 14-day range finding study was conducted in male and female rats in accordance with the Toxicology Division standing operating procedure (SOP) for 14- and 90-Day Feeding Studies (reference 1).

(2) Forty-two male and forty-two female Sprague-Dawley rats 6 to 8 weeks old were used for this study. Following a 1-week acclimatization period, animals were randomly distributed (using the Labcat Randomization Program)* into seven dosage groups consisting of six male and six female rats each. Dosage levels were set at 0 ppm (control), 0 ppm (pair fed control), 125 ppm, 250 ppm, 500 ppm, 1000 ppm, and 2000 ppm. The pair fed control groups containing 0 ppm 4A2NT were started on study 1 week after the high level groups to assure that they received the same amount of feed as the 2000 ppm dosage level consumed in the previous week. A staggered start between males and females was also used to facilitate scheduling of necropsies.

®Purina is a registered trademark of Purina Mills, Inc., St. Louis, Missouri. Use of company names does not imply endorsement by the U.S. Army but is intended only to assist in identification of a specific product.

(3) 4A2NT was ground (mortar and pestle) and mixed with ground rat chow weekly. The compound and feed were mixed for 25-30 min using a Hobart mixer. The mixtures were randomly sampled and independently verified for concentrations (ppm) weekly by GC electron capture detectors. The samples were extracted with acetonitrile, filtered and stored refrigerated until analyzed.

(4) Body weights and feeder weights were observed and recorded on days 0, 1, 3, 7, and 14. Animals were observed daily for toxic signs. Water consumption was not monitored during this study.

(5) Prior to necropsy on day 14, blood samples were collected by intracardiac puncture from all study rats. Clinical chemistry and hematology values were determined from all valid samples (Table 1).

(6) Following the 14-day study period, the surviving rats were euthanized using carbon dioxide. The brain, liver, kidneys, spleen, and tested/ovaries were removed and weighed. These weights were used for calculations of organ-to-body weight and organ-to-brain weight ratios.

(7) Food consumption, body weights, and weight gains were statistically compared using an analysis of variance and when significance was observed the data were further analyzed using a Duncan's post hoc test. Clinical chemistry values, hematology values, organ-to-body weight ratios, and organ-to-brain-weight ratios were statistically compared using an analysis of variance and a Newman-Kuels post hoc test.

c. 90-Day Study.

(1) A 90-day feeding study was conducted in rats in accordance with the Toxicology Division SOP for 14- and 90-day studies (reference 1).

(2) Rats were acclimatized for a 1-week period, then randomly distributed into 5 groups of 10 of each sex. Dose levels were set at 0, 500, 1000, 2000, and 0 ppm (pair fed) based on toxic effects and food consumption seen in the 14-day range finding study. A pair fed control group was included in the study to determine the effects of reduced food consumption in the high dose.

(3) 4A2NT was ground (mortar and pestle) and mixed with ground rat chow weekly. The compound and feed were mixed for 25-30 min using a Hobart mixer. The mixtures were randomly sampled and independently verified for concentrations weekly. After mixing each dose level, compound and feed were refrigerated until needed. All food was discarded every Wednesday during the study. Food was added to the feed jars every Monday, Wednesday, and Friday.

(4) Both sexes were started on test on the same Wednesday. The pair fed control groups were started 1 week after the high dose groups. The 1-week delay allowed a measure of the amount of feed the pair fed control groups received.

(5) Body weights were recorded every week throughout the study. Feeder weights were recorded and feed consumptions were calculated every Monday, Wednesday, and Friday throughout the study. Observations of all animals for sighs of toxicity were made and recorded daily.

(6) On the final day of the study (day 90 for male and day 91 for females), blood samples were collected by intracardiac puncture from all rats. All rats were euthanized with carbon dioxide and necropsied. Following examination of external surfaces and internal cavities, major organs were removed, trimmed, and weighed for organ-to-body-weight and organ-to-brain-weight ratio calculations. Other organs and tissues processed for microscopic examination included all gross lesions, brain, eye, pituitary, tongue, salivary gland, thymus, thyroid, parathyroid, trachea, esophagus, lungs, heart, liver, spleen, stomach, pancreas, lymph node, small and large intestines, adrenals, kidneys, urinary bladder, testes, prostate, ovaries, corpus and cervix uteri, skeletal muscle, fat, nerve, skin, fur, sections of sternebrae, vertebrae, and tibia-femoral joint with marrow.

6. RESULTS

a. Approximate Lethal Dose. The vehicle, PEG 200, had on apparent effect on toxicity. The earliest toxic effects appeared at 3 hours with deaths occuring between 21 hours and 42 hours after treatment. Deaths occurred in the 7500 mg/Kg and 5000 mg/Kg dose groups of both sexes. The male 3333 mg/Kg rat was determined to have died from improper gavage technique. Gross pathology at lethal doses showed multifocal hemorrhagic colitis, mild hemorrhage in the stomach and intestines, and multifocal hemorrhage and congestion of the lungs. No toxic signs were observed in surviving animals and gross pathology observations were unremarkable, though several of the surviving rats had mild congestion of the kidneys.

b. 14-Day Study.

(1) All animals survived to the end of the study. The 2000 ppm exposure groups of both sexes showed statistically significant differences in food consumption, weight gain, body weights, body-to-brain weight ratios, liver-to-body weight ratios and hematology values compared to their respective control groups. The female 2000 ppm group had decreased hemoglobin, hematocrit and red blood cell counts indicating anemia. The testis-to-brain weight ratio showed a statistically significant higher value in the male 2000 ppm group compared to the male control group.

(2) The adrenal-to-brain weight was statistically significantly higher in the female 2000 ppm group compared to the female control group. This data suggest a possible compound related effect in the 2000 ppm exposure groups of both sexes. In addition, the liver-to-body weight ratio showed a statistically significant higher value in the female 1000 ppm exposure group compared to the control group. The male 1000 ppm exposure group showed statistically significant lower food consumption compared to the control group. The lower food consumption in the female 2000 ppm group and the male 2000 ppm and male 1000 ppm groups may be due to possible unpalatability of the compound\food mixture (Appendices B through G).

c. 90-Day Study.

(1) Appendix I shows the average dose (mg/Kg) received by each group for the 90-day study. The male 500 ppm group received approximately 27 mg/Kg/day, with the females receiving 32 mg/Kg/day. The male 1000 ppm group received 52 mg/Kg/day, with the females receiving 65 mg/Kg day. The male 2000 ppm group received 115 mg/Kg/day and the females received 138 mg /Kg/day.

(2) The male 115 mg/Kg/day group and the female 138 mg/Kg/day group showed statistically significant differences in food consumption, body weights, weight gains, clinical chemistry values, hematology values, liver-to-bodyweight ratios, and liver-to-brain weight ratios. The male 115 mg/Kg/day group and the female 138 mg/Kg/day group had decreased hemoglobin values, hematocrit values and red blood cell counts which indicated anemia. The testis-to-brain weight ration and the spleen-to-brain weight compared to the control group. The adrenal-to-brain weight ratio in the female 138 mg/Kg/day group was significantly lower compared to the control group.

(3) The male 52 mg/Kg/day group and the female 65 mg/Kg/day groups showed statistically significant differences in food consumption, weight gain, hematology values, liver-to-body weight ratios, and liver-to-brain weight ratios.

(4) The male 27 mg/Kg/day group showed statistically significant diminished weight gain, higher liver-to-body weight ratios and higher liver-to-brain weight ratios compared to the control group. The female 32 mg/Kg/day group showed no statistically significant differences from the female control group (Appendices H through N).

(5) All animals survived to the end of the 90-day study. At necropsy all the male 115 mg/Kg/day animals had yellow stained pelts, pale livers and minimal body fat. Eight of ten female 138 mg/Kg/day animals had yellow stained pelts at necropsy.

(6) Histopathological examination of tissues and organs taken at necropsy showed that males from the 52 mg/Kg/day and 115 mg/Kg/day groups had a moderate to high incidence of testicular hypospermatogenesis (atrophy). Epididymides of affected testes often showed hypospermia (reduced content of maturing sperm). Testes of two additional males for the 53 mg/Kg/day group had a mild dilitation of seminiferous tubules. The incidence pattern of testicular hypospermatogenesis and epididymal hypospermia were associated with the administration of the test material.

(7) All test groups except the pair fed groups, had a high incidence of cytoplasmic vacuolization of hepatocytes. The vacuolization was more pronounced in the treated males to a lesser extent in the treated females than in the control groups. The change consisted of indistinctly bound cytoplasmic vacuoles, morphologically similar to postprandial glycogen and fat accumulation. In some rats, the vacuolization was more prominent in the periportal region, while in others the change was distributed throughout the liver. The increased severity of vacuolization in the treated groups suggest compound related accentuation of the change.

(8) Males from the 115 mg/Kg/day and 52 mg/Kg/day groups and females from the 138 mg/Kg/day group had a low incidence of trace-level subacute inflammation in the liver. The lesion consisted of infiltration of lymphocytes and a few neutrophils around biliary tracts. The lesion was judged to be of little clinical significance but, coupled with the vacuolization of hepatocytes, was interpreted by the pathologist as evidence of mild hepatotoxicity.

(9) Males from the 115 mg/Kg/day group had a high incidence of cardiomyopathy. The lesion consisted of focal or multifocal degeneration of cardiac myofibers, often with a concurrent infiltration of lymphocytes and proliferation of Anitschkoow myocytes. One male from the 52 mg/Kg/day group showed a similar lesion. The severity and incidence pattern suggest an association with the compound administration in males.

(10) All other lesions are considered to be incidental findings or part of spontaneous disease complexes of laboratory rats.

7. CONCLUSIONS.

a. The conclusion from the Acute Oral Toxicity study follows:

The oral ALD for 4A2NT in both sexes was 5000 mg/Kg.

b. The conclusions for the 14-day study follows:

The data collected in this study suggest a probable compound related effect in the 2000 ppm exposure groups of both sexes. Anemia was evident in the female 2000 ppm exposure group. This statistically significant liver-to-body weight ratio data, suggest a possible compound related effect in the 100 ppm group of both sexes. Based on this study, the 2000 ppm dose group was determined to be the high exposure group for the 90-day study.

c. The conclusions from the 90-day study follows:

This regimen of 4A2NT was associated with testicular hypospermatogenesis (atrophy) and associated depletion of spermatozoa in the epidiymides of rats from the 115 mg/Kg/day and 52 mg/Kg/day dosage groups. Males from the 115 mg/Kg/day dose group had a high incidence of cardiomyopathy that was more severe than that commonly seen in male rats of this age, suggesting a compound-related accentuation of a spontaneous disease process. Male 115 mg/Kg/day and female 138 mg/Kg/day groups had anemia. All groups except the pair fed groups, including the control group, had a high incidence of hepatocellular cytoplasmic vacuolization. The severity of the hepatocellular vacuolization, particularly in males, was associated with the dosage of 4A2NT, suggesting administration of the test material resulted in hepatocellular changes that were morphologically similar to postprandial accumulation of glycogen and fat.

d. Based on this study, a NOAEL was not established. The lowest-observed-adverse-effect-level for this 90-day study is 27 mg/Kg/day for males and 32 mg/Kg/day for females .

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APPROVED:

MAURICE H. WEEKS
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APPENDIX A

REFERENCE

1. Standing Operating Procedure No. 37, USAEHA, Toxicology Division, February 1991, 14-Day Range Finding and 90-Day Feeding Study in Rats.

APPENDIX B

14-DAY RANGE FINDING FEEDING STUDY
4-AMINO-2-NITROTOLUENE
PROJECT 75-55-YJ81-91

SUMMARY OF DAILY MEAN FOOD CONSUMPTION (Grams)

STUDY: YJ81M SEX: MALE

PERIOD	DOSE:(ppm) / GROUP:	0 1-M	0 2-M	125 3-M	250 4-M	500 5-M	1000 6-M	2000 7-M
DAY 1	INTAKE (g)	23**	24**	24**	24**	24**	21**B	18AB
	S.D.	1.9	2.8	1.3	2.1	1.9	1.8	2.4
	EFF. (g/kg)	98	88	103	103	107	97	81
	N	6	6	6	6	6	6	6
DAY 2	INTAKE (g)	--	15	--	--	--	--	--
	S.D.	0.0	2.6	0.0	0.0	0.0	0.0	0.0
	EFF. (g/kg)	--	--	--	--	--	--	--
	N	0	6	0	0	0	0	0
DAY 3	INTAKE (g)	24** B	19A	25**B	24** B	23** B	22**AB	19**A
	S.D.	2.1	0.0	2.0	1.4	1.0	2.4	1.7
	EFF. (g/kg)	101	72	102	98	100	96	83
	N	6	6	6	6	6	6	6
DAY 6	INTAKE (g)	26** B	18 A	27**B	25**B	25** B	23**B	20** A
	S.D.	2.6	2.9	2.3	2.2	1.8	1.6	2.4
	EFF. (g/kg)	--	--	--	--	--	--	--
	N	6	6	6	6	6	6	6
DAY 7	INTAKE (g)	24**B	19** A	25**B	24**B	24** B	21**B	18
	S.D.	1.0	0.0	1.0	1.5	1.2	3.0	2.3
	EFF. (g/kg)	95	71	99	95	95	89	77
	N	6	6	6	6	6	6	6
DAY 8	INTAKE (g)	--	19	--	--	--	--	--
	S.D.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EFF. (g/kg)	--	--	--	--	--	--	--
	N	0	6	0	0	0	0	0
DAY 9	INTAKE (g)	26**	--	27**	26**	25**	23 A	20A
	S.D.	2.0	0.0	1.8	1.8	1.0	2.2	2.1
	EFF. (g/kg)	--	--	--	--	--	--	--
	N	6	0	6	6	6	6	6
DAY 10	INTAKE (g)	27 * B	19A	28 *B	27 * B	27 * B	25 AB	19A
	S.D.	1.7	0.4	0.8	1.8	1.3	2.9	2.2
	EFF. (g/kg)	--	--	--	--	--	--	--
	N	6	6	6	6	6	6	6

34/2 = 17

* P less than .05
** P less than .01
-- = Data Unavailable

Analysis of Variance using DUNCAN'S Procedure

A - Significance with control group (1-M)
B - Significance with pair fed group (2-M)

SUMMARY OF DAILY MEAN FOOD CONSUMPTION (Grams)

STUDY: YJ81M SEX: MALE

PERIOD	DOSE:(ppm) / GROUP:	0 1-M	0 2-M	125 3-M	250 4-M	500 5-M	1000 6-M	2000 7-M
DAY 12	INTAKE (g)	--	19	--	--	--	--	--
	S.D.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EFF. (g/kg)	--	--	--	--	--	--	--
	N	0	6	0	0	0	0	0
DAY 13	INTAKE (g)	27**	19 A	27** B	26** B	26** B	23** AB	18 A
	S.D.	2.4	0.4	2.3	2.1	1.4	2.0	1.9
	EFF. (g/kg)	--	--	--	--	--	--	--
	N	6	6	6	6	6	6	6
DAY 14	INTAKE (g)	27**	19 A	28** B	25** B	25** B	22**	19 A
	S.D.	6.9	0.0	2.7	1.8	2.1	1.5	4.5
	EFF. (g/kg)	95	69	98	91	91	87	74
	N	6	6	6	6	6	6	6

* P less than .05
** P less than .01
-- = Data Unavailable

Analysis of Variance using DUNCAN'S Procedure

A - Significance with control group (1-M)
B - Significance with pair fed group (2-M)

14-DAY RANGE FINDING FEEDING STUDY
4-AMINO-2-NITROTOLUENE
PROJECT 75-55-YJ81-91

SUMMARY OF DAILY MEAN FOOD CONSUMPTION (Grams)

STUDY: YJ8114F SEX: FEMALE PAGE: 1

PERIOD	DOSE: (ppm) / GROUP:	0 / 1-F	125 / 2-F	250 / 3-F	500 / 4-F	1000 / 5-F	2000 / 6-F	0 / 7-F
DAY 1	INTAKE (g)	17**B	16**	17**B	16**B	17**B	11A	13**A
	S.D.	2.2	5.0	2.1	0.8	2.9	1.9	0.4
	EFF. (g/kg)	91	83	89	86	88	58	65
	N	6	6	6	6	6	6	6
DAY 3	INTAKE (g)	19**B	19**B	19**B	18**B	19**B	13**A	13 A
	S.D.	0.6	1.7	1.4	1.5	2.5	2.3	0.0
	EFF. (g/kg)	98	98	95	92	99	71	65
	N	6	6	6	6	6	6	6
DAY 5	INTAKE (g)	--	--	--	--	--	--	13
	S.D.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EFF. (g/kg)	--	--	--	--	--	--	--
	N	0	0	0	0	0	0	6
DAY 6	INTAKE (g)	20**B	19**B	19**B	18**B	19**B	14**A	13 A
	S.D.	4.4	2.8	1.5	1.5	1.9	1.3	0.0
	EFF. (g/kg)	--	--	--	--	--	--	--
	N	6	6	6	6	6	6	6
DAY 7	INTAKE (g)	18**B	17**B	17**B	16**B	16**B	13A	13**A
	S.D.	1.8	2.4	1.5	2.6	2.1	1.8	0.0
	EFF. (g/kg)	90	87	84	82	83	67	65
	N	6	6	6	6	6	6	6
DAY 8	INTAKE (g)	18**	20**	18**	18**	19**	14A	--
	S.D.	2.1	4.3	0.8	1.8	2.6	2.5	0.0
	EFF. (g/kg)	--	--	--	--	--	--	--
	N	6	6	6	6	6	6	0
DAY 9	INTAKE (g)	--	--	--	--	--	--	15
	S.D.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EFF. (g/kg)	--	--	--	--	--	--	--
	N	0	0	0	0	0	0	6
DAY 10	INTAKE (g)	19**B	20**B	21**B	19**B	20**B	16**A	14 A
	S.D.	1.3	1.9	3.5	1.7	1.8	1.0	0.0
	EFF. (g/kg)	--	--	--	--	--	--	--
	N	6	6	6	6	6	6	6

* P less than .05
** P less than .01
-- = Data Unavailable

Analysis of Variance using DUNCAN'S Procedure

A - Significance with control group (1-F)
B - Significance with pair fed group (7-F)

SUMMARY OF DAILY MEAN FOOD CONSUMPTION (Grams)

STUDY: YJ8114F SEX: FEMALE

PERIOD	DOSE:(ppm) / GROUP:	0 1-F	125 2-F	250 3-F	500 4-F	1000 5-F	2000 6-F	0 7-F
DAY 12	INTAKE (g)	--	--	--	--	--	--	15
	S.D.	0.0	0.0	0.0	0.0	0.0	0.0	0.0
	EFF. (g/kg)	--	--	--	--	--	--	--
	N	0	0	0	0	0	0	6
DAY 13	INTAKE (g)	19** B	19** B	19** B	19** B	19**B	14A	14 A
	S.D.	1.9	3.1	2.0	1.3	1.5	1.0	0.0
	EFF. (g/kg)	--	--	--	--	--	--	--
	N	6	6	6	6	6	6	6
DAY 14	INTAKE (g)	19** B	20**B	19** B	18** B	19** B	15A	14 A
	S.D.	2.1	1.8	0.8	2.5	1.6	1.9	0.4
	EFF. (g/kg)	91	95	92	86	91	78	69
	N	6	6	6	6	6	6	6

* P less than .05
** P less than .01
-- = Data Unavailable

Analysis of Variance using DUNCAN'S Procedure

A - Significance with control group (1-F)
B - Significance with pair fed group (7-F)

APPENDIX C

14-DAY RANGE FINDING FEEDING STUDY
4-AMINO-2-NITROTOLUENE
PROJECT 75-55-YJ81-91

SUMMARY OF BODY WEIGHTS (Grams)

STUDY: YJ81M SEX: MALE PAGE: 1

PERIOD	DOSE: (ppm) / GROUP:	0 1-M	0 2-M	125 3-M	250 4-M	500 5-M	1000 6-M	2000 7-M
DAY 0	MEAN	232** B	268** A	230** B	230** B	224** B	217 B	224** B
	S.D.	15.6	14.3	10.8	20.9	12.0	20.6	18.2
	N	6	6	6	6	6	6	6
DAY 1	MEAN	234** B	277** A	235** B	236** B	231** B	222 B	223 B
	S.D.	14.6	14.6	10.3	21.4	12.3	19.7	15.1
	N	6	6	6	6	6	6	6
DAY 3	MEAN	249	261	249	248	244	236	234
	S.D.	14.9	10.5	10.2	20.3	12.4	21.4	15.4
	N	6	6	6	6	6	6	6
DAY 7	MEAN	278	271	281	274	272	260	253
	S.D.	15.8	13.1	13.9	20.2	11.3	24.4	13.8
	N	6	6	6	6	6	6	6
DAY 14	MEAN	322** B	284** A	330** B	317** B	314** B	298**	275 A
	S.D.	21.8	13.2	15.3	20.9	10.1	26.7	20.0
	N	6	6	6	6	6	6	6

* P less than .05
** P less than .01

Analysis of Variance using DUNCAN'S Procedure

A - Significance with control group (1-M)
B - Significance with pair fed group (2-M)

14-DAY RANGE FINDING FEEDING STUDY
4-AMINO-2-NITROTOLUENE
PROJECT 75-55-YJ81-91

SUMMARY OF BODY WEIGHTS (Grams)

STUDY: YJ8114F SEX: FEMALE

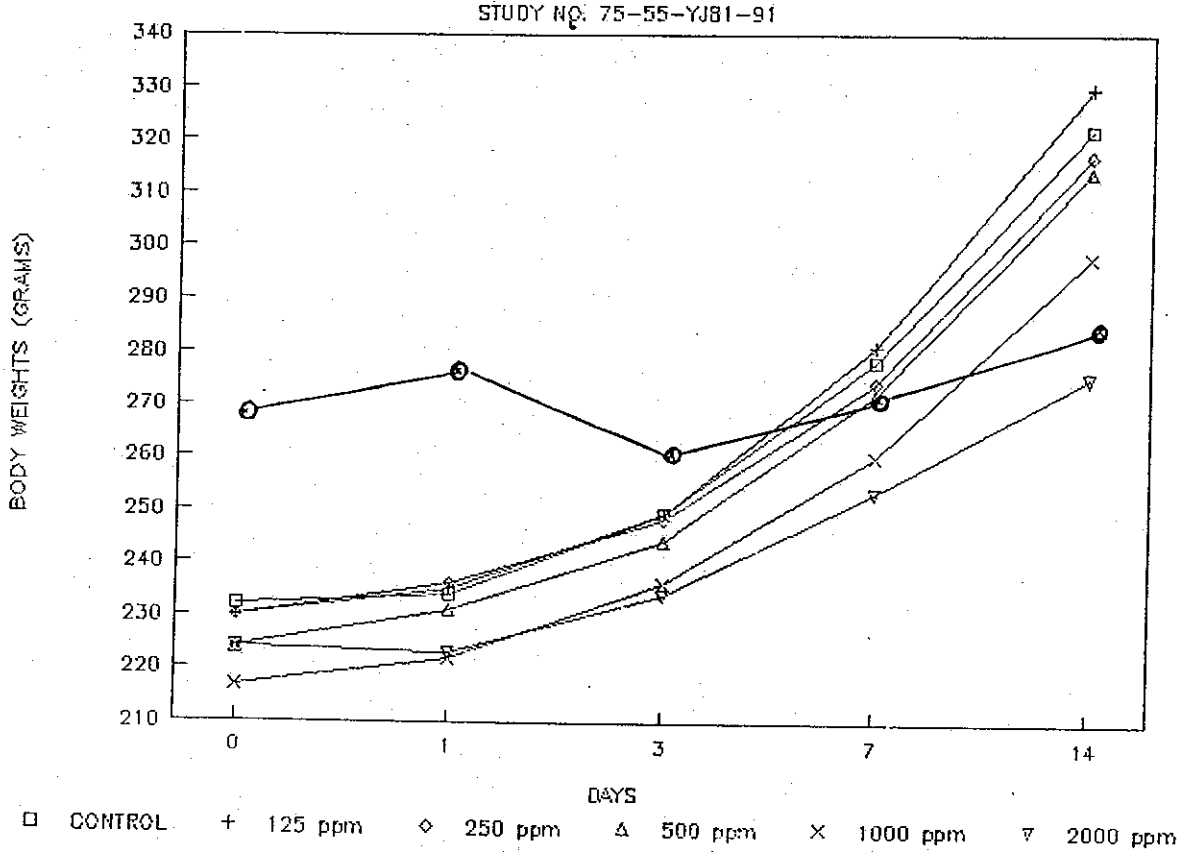
PERIOD	DOSE: (ppm) / GROUP:	0 1-F	125 2-F	250 3-F	500 4-F	1000 5-F	2000 6-F	0 7-F
DAY 0	MEAN	189	187	191	189	188	183	207
	S.D.	15.1	12.8	15.3	15.5	16.5	13.1	14.6
	N	6	6	6	6	6	6	6
DAY 1	MEAN	193	188	193	190	187	180	202
	S.D.	15.1	15.9	13.5	14.7	18.3	16.2	14.3
	N	6	6	6	6	6	6	6
DAY 3	MEAN	198	196	198	197	193	185	192
	S.D.	15.9	16.4	16.4	16.9	17.9	17.1	13.7
	N	6	6	6	6	6	6	6
DAY 7	MEAN	209	206	209	207	205	196	195
	S.D.	18.2	18.2	16.7	13.4	19.9	15.8	13.5
	N	6	6	6	6	6	6	6
DAY 14	MEAN	227**	225**	230**	223**	222**	201	203
	S.D.	19.8	19.9	17.9	15.9	19.6	15.4	11.8
	N	6	6	6	6	6	6	6

* P less than .05
** P less than .01

Analysis of Variance using DUNCAN'S Procedure

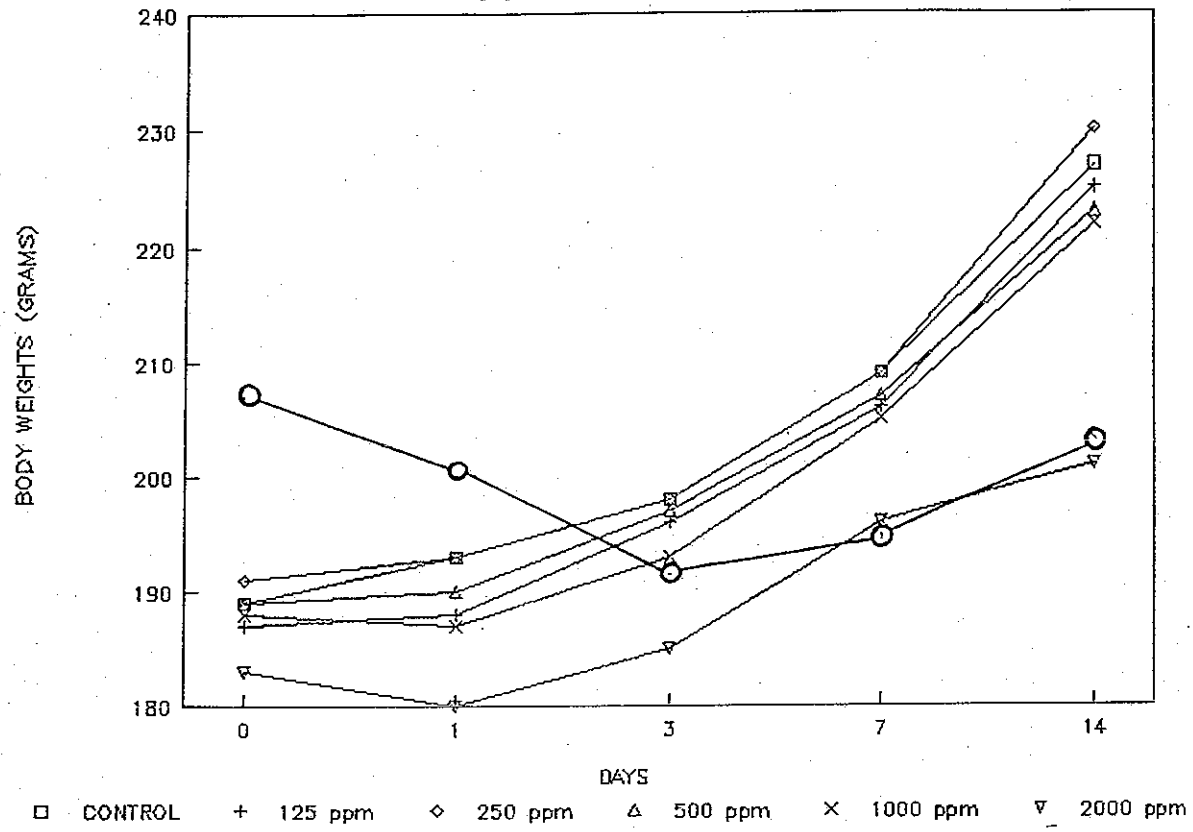
MALE 14-DAY FEEDING STUDY

STUDY NO. 75-55-YJ81-91



FEMALE 14-DAY FEEDING STUDY

STUDY NO. 75-55-YJ81-91



APPENDIX D

SUMMARY OF DAILY WEIGHT GAINS (Grams)

STUDY: YJ8114F SEX: FEMALE

PERIOD	DOSE: (ppm) / GROUP:	0 1-F	125 2-F	250 3-F	500 4-F	1000 5-F	2000 6-F	0 7-F
DAY 1	MEAN	4** B	1** B	2** B	2** B	-1 *AB	-3 A	-6 A
	S.D.	2.9	5.0	2.6	3.2	3.6	3.5	1.6
	N	6	6	6	6	6	6	6
DAY 3	MEAN	3** B	4** B	3** B	4** B	4** B	3** B	-5 A
	S.D.	1.7	0.8	1.9	1.2	0.5	2.1	1.5
	N	6	6	6	6	6	6	6
DAY 7	MEAN	3** B	3** B	3** B	3** B	3** B	3** B	1 A
	S.D.	1.0	0.8	0.6	1.8	0.6	1.2	0.4
	N	6	6	6	6	6	6	6
DAY 14	MEAN	3** B	3** B	3** B	2** B	3** B	1 A	1 A
	S.D.	0.5	1.0	0.4	0.5	0.5	0.5	0.4
	N	6	6	6	6	6	6	6

* P less than .05
** P less than .01

Analysis of Variance using DUNCAN'S Procedure

A - Significance with control group (1-F)
B - Significance with pair fed group (7-F)

14-DAY RANGE FINDING FEEDING STUDY
4-AMINO-2-NITROTOLUENE
PROJECT 75-55-YJ81-91

SUMMARY OF DAILY WEIGHT GAINS (Grams)

STUDY: YJ81M SEX: MALE

PERIOD	DOSE: (ppm) / GROUP:	0 1-M	0 2-M	125 3-M	250 4-M	500 5-M	1000 6-M	2000 7-M
DAY 1	MEAN	2 B	9**A	5** B	6**A	7** A	5** B	-1 B
	S.D.	4.9	1.9	1.5	2.2	1.2	2.1	4.0
	N	6	6	6	6	6	6	6
DAY 3	MEAN	8**B	-8 A	8** B	6**B	7** B	7** B	5**AB
	S.D.	1.0	3.6	0.8	1.7	0.8	1.1	1.0
	N	6	6	6	6	6	6	6
DAY 7	MEAN	7**B	2 A	8** B	7**B	7** B	6** B	5**AB
	S.D.	0.8	1.4	1.3	1.0	0.8	1.5	1.5
	N	6	6	6	6	6	6	6
DAY 14	MEAN	6**B	2 A	7** B	6**B	6** B	6** B	3 *A
	S.D.	1.1	0.4	0.6	0.5	0.6	0.8	1.7
	N	6	6	6	6	6	6	6

* P less than .05
** P less than .01

Analysis of Variance using DUNCAN'S Procedure

A - Significance with control group (1-M)
B - Significance with pair fed group (2-M)

APPENDIX E

CLINICAL CHEMISTRY
14-DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
FEMALE

	GROUP #		BUN	TRIG	CHOL	TOTAL PROTEIN	CALCIUM
0ppm	1	mean	24.8	227.3	73.95	7.32	10.18
		std	1.61	63.9	15.2	0.542	0.564
		sem	0.608522	24.15192	5.745059	0.204856	0.213171
125ppm	2	mean	24.8 B	221.5 B	84.5	7.03 B	10.15
		std	1.23	41.3	10.7	0.314	0.558
		sem	0.464896	15.60993	4.044219	0.118680	0.210904
250ppm	3	mean	27.2 B	281.2 B	94.2	7.08 B	10.03
		std	4.4	27.1	14.2	0.299	0.656
		sem	1.663043	10.24283	5.367095	0.113011	0.247944
500ppm	4	mean	27.6 B	250.3 B	87.7	7.38 B	10.48
		std	1.69	61.5	7.88	0.293	0.4916
		sem	0.638759	23.24481	2.978360	0.110743	0.185807
1000ppm	5	mean	21.48 B	183.3	90.46	6.7 A	10.05 B
		std	3.98	30.3	16.52	0.268	0.281
		sem	1.504298	11.45232	6.243973	0.101294	0.106208
2000ppm	6	mean	21.73 B	203.8	96.4	6.35 A	9.97 B
		std	2.11	19.5	13.26	0.362	0.535
		sem	0.797505	7.370307	5.011808	0.136823	0.202210
*0ppm	7	mean	15.7 A	145.3 A	74.05	6.43 A	10.92 A
		std	2.37	44.7	10.5	0.463	0.402
		sem	0.895775	16.89501	3.968626	0.174997	0.151941

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE FROM GROUP 1 p= 0.05
B- SIGNIFICANCE WITH GROUP 7 (RESTRICTED DIET) p= 0.05

CLINICAL CHEMISTRY
14-DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
FEMALE

	GROUP #		ALKPHOS	SGOT	SGPT
0ppm	1	mean	386	111.3	47.9
		std	120.4	14.9	6.17
		sem	45.50692	5.631670	2.332040
125ppm	2	mean	357.7	104.7	42.48
		std	98.2	35.9	9.02
		sem	37.11611	13.56892	3.409239
250ppm	3	mean	349	102	41.87
		std	118.3	17.5	8.51
		sem	44.71319	6.614378	3.216477
500ppm	4	mean	352.7	107	39.55
		std	127.1	13.8	10.24
		sem	48.03928	5.215909	3.870356
1000ppm	5	mean	319.3	122.2	40.58
		std	74.3	37	2.85
		sem	28.08276	13.98468	1.077198
2000ppm	6	mean	358.2	104	36.82
		std	72.6	24.8	4.57
		sem	27.44022	9.373518	1.727297
*0ppm	7	mean	230.3	126.9	34.47
		std	88.7	108.8	4.83
		sem	33.52544	41.12253	1.825568

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE FROM GROUP 1 p= 0.05
B- SIGNIFICANCE WITH GROUP 7 (RESTRICTED DIET) p= 0.05

CLINICAL CHEMISTRY
14-DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
MALE

	GROUP #		BUN	TRIG	CHOL	PROTEIN	CALCIUM
0ppm	1	mean	17.5	335.5	65.3	6.65	10.4
		std	1.9	57.4	7.6	0.3	1
		sem	0.718132	21.69516	2.872529	0.113389	0.377964
125ppm	2	mean	18	385.7 B	62.8	6.6	10.6
		std	4	112.5	8.8	0.28	0.16
		sem	1.511857	42.52100	3.326087	0.105830	0.060474
250ppm	3	mean	18	348.7 B	63.5	6.32	10.6
		std	1.9	69	7.7	0.4	0.65
		sem	0.718132	26.07954	2.910326	0.151185	0.245676
500ppm	4	mean	17	334.5 B	76.1	6.28	10.2
		std	2.5	139.4	5	0.5	0.28
		sem	0.944911	52.68824	1.889822	0.188982	0.105830
1000ppm	5	mean	15.5	256	88.5 A	6.11	10.1
		std	1.7	61.7	16.7	0.33	0.48
		sem	0.642539	23.32040	6.312006	0.124728	0.181422
2000ppm	6	mean	20.1	320.4 B	87 A	5.84 AB	10.4
		std	3	70	15.3	0.7	0.53
		sem	1.133893	26.45751	5.782856	0.264575	0.200321
*0ppm	7	mean	16.2	169.5 A	73.9	6.78	9.5
		std	1.6	42.5	11.3	0.19	0.61
		sem	0.604743	16.06349	4.270998	0.071813	0.230558

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE FROM GROUP 1 P= 0.05
B- SIGNIFICANCE WITH GROUP 7 (RESTRICTED DIET) P= 0.05

CLINICAL CHEMISTRY
14-DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
MALE

	GROUP #		ALKPHOS	SGOT	SGPT	BILI	GLU
0ppm	1	mean	602.2	90	38.8	0.433	153.7
		std	117.1	18.1	5.1	0.12	16.7
		sem	44.25963	6.841156	1.927618	0.045355	6.312006
125ppm	2	mean	514.3 B	91.5	39	0.567	160.2 B
		std	213.7	32.2	3.3	0.1	13.4
		sem	80.77100	12.17045	1.247282	0.037796	5.064723
250ppm	3	mean	568.3 B	127.2	37.7	0.533	159.8 B
		std	88.2	72.5	7.3	0.14	16.3
		sem	33.33646	27.40242	2.759140	0.052915	6.160820
500ppm	4	mean	491 B	161.8	41.6	0.5	160.5 B
		std	104.9	145.2	8.5	0.21	20.9
		sem	39.64847	54.88044	3.212698	0.079372	7.899457
1000ppm	5	mean	469.7 B	122.5	40.5	0.3833	179 B
		std	118.3	93	7.3	0.15	27.8
		sem	44.71319	35.15069	2.759140	0.056694	10.50741
2000ppm	6	mean	486.4 B	114.6	34.4	0.298	132.8
		std	215.3	59.5	3.7	0.41	12.2
		sem	81.37575	22.48888	1.398468	0.154965	4.611166
*0ppm	7	mean	164.5 A	108.1	36.4	0.35	120.1 A
		std	60.9	17	6.6	0.054	16.5
		sem	23.01803	6.425396	2.494565	0.020410	6.236413

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE FROM GROUP 1 P= 0.05
B- SIGNIFICANCE WITH GROUP 7 (RESTRICTED DIET) P= 0.05

APPENDIX F

HEMATOLOGY
14-DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
MALE

	GROUP #		HGB	MCV	PLT	MCH	HCT
0ppm	1	mean	14.4	61.7	1028	22.27	39.9
		std	0.74	2.08	349	0.77	3.23
		sem	0.279693	0.786166	131.9096	0.291032	1.220825
125ppm	2	mean	14.9 B	61.3 B	1248	22.27	41 B
		std	0.43	2.91	117.2	0.98	1.45
		sem	0.162524	1.099876	44.29743	0.370405	0.548048
250ppm	3	mean	14.8 B	61.1 B	1033	21.58	41.9 B
		std	0.69	2.21	271	1.55	1.61
		sem	0.260795	0.835301	102.4283	0.585844	0.608522
500ppm	4	mean	15 B	60.5 B	1300	21.85	41.3 B
		std	0.91	2.34	131	0.78	2.16
		sem	0.343947	0.884436	49.51334	0.294812	0.816403
1000ppm	5	mean	15 B	60.1 B	1347	21.62	41.7 B
		std	0.41	1.94	328.9	0.7	1.53
		sem	0.154965	0.733251	124.3125	0.264575	0.578285
2000ppm	6	mean	14.8 B	60.5 B	1588 AB	21.5	41.7
		std	0.27	1.91	193.4	0.65	1.06
		sem	0.102050	0.721912	73.09832	0.245676	0.400642
*0ppm	7	mean	16.1 A	57.1 A	1081.7	20.62	44.5 A
		std	0.48	1.66	178.9	0.54	1.11
		sem	0.181422	0.627421	67.61784	0.204100	0.419540

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE FROM GROUP 1 P= 0.05
B- SIGNIFICANCE WITHD GROUP 7 (RESTRICTED DIET) P= 0.05

HEMATOLOGY
14-DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
MALE

	GROUP #		RBC	WBC	MCHC
0ppm	1	mean	6.47	12.23	36.12
		std	0.46	5.69	1.81
		sem	0.173863	2.150617	0.684115
125ppm	2	mean	6.7 B	12.67	36.32
		std	0.21	3.32	0.5
		sem	0.079372	1.254842	0.188982
250ppm	3	mean	6.87 B	12.7	35.33
		std	0.43	2.06	2.25
		sem	0.162524	0.778606	0.850420
500ppm	4	mean	6.83 B	12.85	36.13
		std	0.55	4.52	0.4
		sem	0.207880	1.708399	0.151185
1000ppm	5	mean	6.95 B	12.32	35.98
		std	0.38	1.95	0.55
		sem	0.143626	0.737030	0.207880
2000ppm	6	mean	6.9 B	16.62 B	35.58
		std	0.24	4.19	0.56
		sem	0.090711	1.583671	0.211660
*0ppm	7	mean	7.8 A	7.55 A	36.13
		std	0.36	2.36	0.25
		sem	0.136067	0.891996	0.094491

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE FROM GROUP 1 P= 0.05
B- SIGNIFICANCE WITH GROUP 7 (RESTRICTED DIET) P= 0.05

HEMATOLOGY
14-DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
FEMALE

	GROUP #		HGB	MCV	PLT	MCH	HCT
0ppm	1	mean	15.2	56.67	1153	20.25	42.55
		std	0.335	1.7	91.4	0.737	1.42
		sem	0.126618	0.642539	34.54595	0.278559	0.536709
125ppm	2	mean	14.9	55.87	1073	20	41.7
		std	0.46	1.06	108.2	0.446	1.37
		sem	0.173863	0.400642	40.89575	0.168572	0.517811
250ppm	3	mean	15.22	56.3	1158	20.4	41.95
		std	0.662	0.827	237.5	0.472	2.33
		sem	0.250212	0.312576	89.76656	0.178399	0.880657
500ppm	4	mean	14.92	57.017	1161.7	20.75	41
		std	0.668	1.47	83	0.782	2.05
		sem	0.252480	0.555607	31.37105	0.295568	0.774827
1000ppm	5	mean	14.68	57.5 B	1131.7	20.78	40.6
		std	0.426	1.17	298	0.264	1.5
		sem	0.161012	0.442218	112.6334	0.099782	0.566946
2000ppm	6	mean	12.65 AB	56.75	1423 B	20.08	35.72 AB
		std	0.561	1.51	162.8	0.553	1.46
		sem	0.212038	0.570726	61.53261	0.209014	0.551828
*0ppm	7	mean	15.13	55.18	811.7	19.87	42.05
		std	0.489	0.462	582.7	0.175	1.63
		sem	0.184824	0.174619	220.2398	0.066143	0.616082

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE FROM GROUP 1 p= 0.05
B- SIGNIFICANCE WITH GROUP 7 (RESTRICTED DIET) p= 0.05

HEMATOLOGY
14-DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
FEMALE

	GROUP #		RBC	WBC	MCHC
0ppm	1	mean	7.52	12.2	35.73
		std	0.376	3.41	0.488
		sem	0.142114	1.288858	0.184446
125ppm	2	mean	7.47	11.42	35.57
		std	0.225	3.2	0.535
		sem	0.085042	1.209486	0.202210
250ppm	3	mean	7.45	13.17	36.3
		std	0.404	6.26	0.576
		sem	0.152697	2.366057	0.217707
500ppm	4	mean	7.2	9.78	36.4
		std	0.424	4.96	0.837
		sem	0.160256	1.874703	0.316356
1000ppm	5	mean	7.07	12.35	36.15
		std	0.197	1.31	0.451
		sem	0.074459	0.495133	0.170461
2000ppm	6	mean	6.3 AB	17.55 B	32.07
		std	0.29	4.32	8.17
		sem	0.109609	1.632806	3.087969
*0ppm	7	mean	7.62	7.7	36
		std	0.279	1.5	0.438
		sem	0.105452	0.566946	0.165548

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE FROM GROUP 1 p= 0.05
B- SIGNIFICANCE WITH GROUP 7 (RESTRICTED DIET) p= 0.05

APPENDIX G

ORGAN TO BRAIN WEIGHT RATIO
14-DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
MALE

	GROUP #		TESTES BRAIN	SPLEEN BRAIN	LIVER BRAIN	KIDNEY BRAIN	ADRENAL BRAIN
0ppm	1	mean	1.54	0.334	8.03	1.46	0.0302
		std	0.0373	0.057	0.874	0.191	0.003458
		sem	0.014098	0.021543	0.330340	0.072191	0.001307
125ppm	2	mean	1.51	0.342	8.89 B	1.51 B	0.0336
		std	0.0925	0.0302	0.942	0.071	0.01898
		sem	0.034961	0.011414	0.356042	0.026835	0.007173
250ppm	3	mean	1.58	0.363	8.305 B	1.4	0.03037
		std	0.126	0.0427	0.438	0.161	0.004975
		sem	0.047623	0.016139	0.165548	0.060852	0.001880
500ppm	4	mean	1.53	0.368	8.79 B	1.49 B	0.03435
		std	0.16	0.0527	0.96	0.13	0.0107
		sem	0.060474	0.019918	0.362845	0.049135	0.004044
1000ppm	5	mean	1.49	0.328	8.21 B	1.33	0.0308
		std	0.155	0.0567	0.704	0.128	0.002419
		sem	0.058584	0.021430	0.266086	0.048379	0.000914
2000ppm	6	mean	2.42 AB	0.342	7.7 B	1.28	0.034087
		std	0.262	0.055	0.791	0.0825	0.007975
		sem	0.099026	0.020788	0.298969	0.031182	0.003014
*0ppm	7	mean	1.61	0.29	5.43 A	1.25	0.046296
		std	0.109	0.029	0.684	0.104	0.018056
		sem	0.041198	0.010960	0.258527	0.039308	0.006824

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE FROM GROUP 1 P= 0.05
B- SIGNIFICANCE WITH GROUP 7 (RESTRICTED DIET) P= 0.05

ORGAN TO BRAIN WEIGHT RATIO
14-DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
FEMALE

	GROUP #		OVARIES BRAIN	SPLEEN BRAIN	LIVER BRAIN	KIDNEY BRAIN	ADRENAL BRAIN
0ppm	1	mean	0.079588	0.2746	5.158 B	1.04	0.05097
		std	0.010213	0.03167	0.54	0.0563	0.0118
		sem	0.003860	0.011970	0.204100	0.021279	0.004459
125ppm	2	mean	0.076051	0.2699	5.354 B	1.001	0.04583
		std	0.01288	0.03798	0.186	0.113	0.00442
		sem	0.004868	0.014355	0.070301	0.042709	0.001670
250ppm	3	mean	0.080143	0.2508	5.523 B	1.001	0.0437
		std	0.016727	0.0569	0.5	0.0725	0.00744
		sem	0.006322	0.021506	0.188982	0.027402	0.002812
500ppm	4	mean	0.073178	0.2648	5.393 B	0.989	0.044
		std	0.008063	0.0314	0.621	0.078	0.00628
		sem	0.003047	0.011868	0.234715	0.029481	0.002373
1000ppm	5	mean	0.073746	0.2958	5.813 B	0.983	0.0426
		std	0.018866	0.0494	0.697	0.0773	0.00434
		sem	0.007130	0.018671	0.263441	0.029216	0.001640
2000ppm	6	mean	0.06983	0.3111 B	5.313 B	0.924	0.0348 A
		std	0.009685	0.0403	0.495	0.0828	0.0103
		sem	0.003660	0.015231	0.187092	0.031295	0.003893
*0ppm	7	mean	0.063536	0.2314	3.904 A	0.896 A	0.0374 A
		std	0.018401	0.0149	0.425	0.0485	0.0029
		sem	0.006954	0.005631	0.160634	0.018331	0.001096

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE FROM GROUP 1 p= 0.05
B- SIGNIFICANCE WITH GROUP 7 (RESTRICTED DIET) p= 0.05

APPENDIX H

ORGAN TO BODY WEIGHT RATIO
14-DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
MALE

	GROUP #		TESTIS BODY	SPLEEN BODY	LIVER BODY	KIDNEY BODY	BRAIN BODY
0ppm	1	mean	0.009	0.00196	0.04688	0.008498	0.00586
		std	0.000632	0.000398	0.003555	0.000832	0.000416
		sem	0.000238	0.000150	0.001343	0.000314	0.000157
125ppm	2	mean	0.0086 B	0.00195	0.05055 B	0.008608	0.0057 B
		std	0.000606	0.000185	0.003924	0.000658	0.000214
		sem	0.000229	0.000069	0.001483	0.000248	0.000080
250ppm	3	mean	0.0094	0.002147	0.049 B	0.00824	0.00592 B
		std	0.001118	0.000261	0.000857	0.00068	0.000372
		sem	0.000422	0.000098	0.000323	0.000257	0.000140
500ppm	4	mean	0.009	0.002175	0.05168	0.00879	0.005896 B
		std	0.000786	0.000393	0.004648 B	0.000608	0.000361
		sem	0.000297	0.000148	0.001756	0.000229	0.000136
1000ppm	5	mean	0.0095	0.002071	0.051956 B	0.008419	0.006348
		std	0.000986	0.000223	0.003412	0.000472	0.000393
		sem	0.000372	0.000084	0.001289	0.000178	0.000148
2000ppm	6	mean	0.0168 AB	0.002383	0.05327 AB	0.008834	0.006939 A
		std	0.002266	0.0005	0.004406	0.000433	0.000414
		sem	0.000856	0.000188	0.001665	0.000163	0.000156
*0ppm	7	mean	0.0106	0.00191	0.03555 A	0.008234	0.006589 A
		std	0.000622	0.00021	0.002805	0.000611	0.000475
		sem	0.000235	0.000079	0.001060	0.000230	0.000179

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE FROM GROUP 1 P= 0.05
B- SIGNIFICANCE WITH GROUP 7 (RESTRICTED DIET) P= 0.05

ORGAN TO BODY WEIGHT RATIO, FINAL BODY WEIGHT
14-DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
MALE

	GROUP #		ADRENAL BODY	BODY
0ppm	1	mean	0.000177	321.7
		std	0.000021	21.8
		sem	0.000007	8.239625
125ppm	2	mean	0.000195	330 B
		std	0.000118	15.3
		sem	0.000044	5.782856
250ppm	3	mean	0.00018	317.3 B
		std	0.000031	20.9
		sem	0.000011	7.899457
500ppm	4	mean	0.000203	313.5 B
		std	0.000068	10.1
		sem	0.000025	3.817441
1000ppm	5	mean	0.000196	298.3
		std	0.000018	26.7
		sem	0.000006	10.09165
2000ppm	6	mean	0.000235	274.7 A
		std	0.000047	20
		sem	0.000017	7.559289
*0ppm	7	mean	0.000302	283.7 A
		std	0.000109	13.2
		sem	0.000041	4.989131

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE FROM GROUP 1 P= 0.05
B- SIGNIFICANCE WITH GROUP 7 (RESTRICTED DIET) P= 0.05

ORGAN TO BODY WEIGHT RATIO
14-DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
FEMALE

	GROUP #		OVARIES BODY	SPLEEN BODY	LIVER BODY	KIDNEY BODY	BRAIN BODY
0ppm	1	mean	0.00063	0.00218	0.0409	0.008275	0.00798
		std	0.000081	0.000203	0.00133	0.000392	0.000659
		sem	0.000030	0.000076	0.000502	0.000148	0.000249
125ppm	2	mean	0.000601	0.00215	0.0426 B	0.007945	0.00796
		std	0.000079	0.000385	0.00142	0.000744	0.000485
		sem	0.000029	0.000145	0.000536	0.000281	0.000183
250ppm	3	mean	0.000624	0.00196	0.0432 B	0.00785	0.00785
		std	0.000107	0.000407	0.00196	0.000525	0.000461
		sem	0.000040	0.000153	0.000740	0.000198	0.000174
500ppm	4	mean	0.000602	0.00218	0.044 B	0.00811	0.00823
		std	0.000087	0.000367	0.0023	0.00067	0.000814
		sem	0.000032	0.000138	0.000869	0.000253	0.000307
1000ppm	5	mean	0.000587	0.00237	0.0461 A B	0.00782	0.00799
		std	0.000141	0.000337	0.00203	0.000417	0.000663
		sem	0.000053	0.000127	0.000767	0.000157	0.000250
2000ppm	6	mean	0.000628	0.0028 AB	0.0479 A B	0.008348	0.00908 A
		std	0.00004	0.000232	0.00207	0.00064	0.00084
		sem	0.000015	0.000087	0.000782	0.000241	0.000317
*0ppm	7	mean	0.000555	0.002	0.03425 A	0.00786	0.0088
		std	0.000148	0.000156	0.003215	0.000312	0.000522
		sem	0.000055	0.000058	0.001215	0.000117	0.000197

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE FROM GROUP 1 p= 0.05
B- SIGNIFICANCE WITH GROUP 7 (RESTRICTED DIET) p= 0.05

ORGAN TO BODY WEIGHT RATIO, FINAL BODY WEIGHT
14-DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
FEMALE

	GROUP #		ADRENAL BODY	BODY
0ppm	1	mean	0.000404	227.3
		std	0.000088	19.8
		sem	0.000033	7.483696
125ppm	2	mean	0.000364	224.5
		std	0.000031	19.9
		sem	0.000011	7.521493
250ppm	3	mean	0.000341	229.8
		std	0.000044	17.9
		sem	0.000016	6.765564
500ppm	4	mean	0.000359	223
		std	0.000031	15.94
		sem	0.000011	6.024753
1000ppm	5	mean	0.00034	221.5
		std	0.000038	19.63
		sem	0.000014	7.419442
2000ppm	6	mean	0.000311	201.3
		std	0.00008	15.41
		sem	0.000030	5.824432
*0ppm	7	mean	0.000328	203.3
		std	0.000024	11.79
		sem	0.000009	4.456201

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE FROM GROUP 1 p= 0.05
B- SIGNIFICANCE WITH GROUP 7 (RESTRICTED DIET) p= 0.05

APPENDIX I

90-DAY FEEDING STUDY
4-AMINO-2-NITROTOULENE
PROJECT 75-55-YJ81-91

APPENDIX I

PREDICTED VERSUS ACTUAL DAILY DOSES

DOSE Predicted	ACTUAL DAY 0-DAY 28	ACTUAL DAY 28-DAY 56	ACTUAL DAY 56-DAY 90
MALES			
500 ppm	412 ppm 30 mg/kg/day	448 ppm 26 mg/kg/day	518 ppm 26 mg/kg/day
1,000 ppm	815 ppm 57 mg/kg/day	886 ppm 52 mg/kg/day	965 ppm 48 mg/kg/day
2000 ppm	1687 ppm 117 mg/kg/day	1787 ppm 110 mg/kg/day	1950 ppm 117 mg/kg/day
FEMALES			
500 ppm	412 ppm 35 mg/kg/day	448 ppm 33 mg/kg/day	518 ppm 28 mg/kg/day
1,000 ppm	815 ppm 66 mg/kg/day	886 ppm 65 mg/kg/day	965 ppm 64 mg/kg/day
2,000 ppm	1687 ppm 141 mg/kg/day	1787 ppm 136 mg/kg/day	1950 ppm 136 mg/kg/day

APPENDIX J

90-DAY FEEDING STUDY
4-AMINO-2-NITROTOLUENE
PROJECT 75-55-YJ81-91

SUMMARY OF DAILY MEAN FOOD CONSUMPTION (Grams)

STUDY: 4A2NT-M SEX: MALE PAGE: 1

PERIOD	DOSE:(ppm) / GROUP:	0 1-M	500 2-M	1000 3-M	2000 4-M	0 5-M
DAY 2	INTAKE (g)	26**B	26** B	25** B	19 AB	21** A
	S.D.	2.1	1.6	1.1	2.3	0.5
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 5	INTAKE (g)	27**B	28** B	26** B	21**A	21 A
	S.D.	1.8	1.8	1.3	2.0	0.4
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 7	INTAKE (g)	27**B	29**AB	27** B	21** A	21 A
	S.D.	2.7	1.3	1.9	2.5	0.5
	EFF. (g/kg)	110	118	109	91	75
	N	10	10	10	10	10
DAY 9	INTAKE (g)	28**B	28** B	27** B	21**A	21 A
	S.D.	2.0	1.8	1.9	3.1	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 12	INTAKE (g)	29**B	29** B	27** B	22**A	21 A
	S.D.	1.7	1.8	1.9	2.6	2.3
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 14	INTAKE (g)	29** B	29** B	27** B	19 A	21** A
	S.D.	1.6	1.7	1.4	5.0	0.3
	EFF. (g/kg)	104	107	101	77	75
	N	10	10	10	10	10
DAY 16	INTAKE (g)	28**B	28** B	27** B	21**A	21 A
	S.D.	1.5	2.5	2.3	2.0	0.3
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 19	INTAKE (g)	29**B	29** B	27** B	21 A	22** A
	S.D.	2.4	2.1	2.4	2.1	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10

* P less than .05
** P less than .01

Analysis of Variance using DUNCAN'S Procedure

A - Significance with control Group 1
B - SIgnificance with pair Fed group 5

SUMMARY OF DAILY MEAN FOOD CONSUMPTION (Grams)

STUDY: 4A2NT-M SEX: MALE

PERIOD	DOSE:(ppm) / GROUP:	0 / 1-M	500 / 2-M	1000 / 3-M	2000 / 4-M	0 / 5-M
DAY 21	INTAKE (g)	29** B	30** B	27** B	24 A	22 A
	S.D.	2.8	1.9	2.5	2.9	0.3
	EFF. (g/kg)	97	103	93	92	76
	N	10	10	10	10	10
DAY 23	INTAKE (g)	29** B	30** B	28** AB	23 A	22 A
	S.D.	2.5	2.4	1.7	1.8	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 26	INTAKE (g)	29** B	29** B	28** B	23 A	23 A
	S.D.	1.8	1.6	2.4	1.8	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 28	INTAKE (g)	30** B	28** B	28** B	25 *A	23 A
	S.D.	2.5	2.7	1.5	3.8	0.0
	EFF. (g/kg)	97	93	92	95	76
	N	10	10	10	10	10
DAY 30	INTAKE (g)	28** B	28** B	27** B	23 A	23 A
	S.D.	1.8	1.5	2.0	2.1	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 31	INTAKE (g)	--	28	--	--	--
	S.D.	0.0	4.1	0.0	0.0	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	0	4	0	0	0
DAY 33	INTAKE (g)	28** B	31** B	26**	21 A	23 A
	S.D.	1.4	7.3	2.9	2.2	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 35	INTAKE (g)	28** B	27** B	27** B	23 A	22 A
	S.D.	1.5	2.0	2.1	2.4	0.3
	EFF. (g/kg)	86	86	86	85	70
	N	10	10	10	10	10

* P less than .05
** P less than .01
-- = Data Unavailable

Analysis of Variance using DUNCAN'S Procedure
A - Significance with control group (1-M)
B - Significance with pair Fed group (5-M)

SUMMARY OF DAILY MEAN FOOD CONSUMPTION (Grams)

STUDY: 4A2NT-M SEX: MALE PAGE: 3

PERIOD	DOSE:(ppm) / GROUP:	0 1-M	500 2-M	1000 3-M	2000 4-M	0 5-M
DAY 37	INTAKE (g)	28** B	27** B	24**A	22A	23 A
	S.D.	2.3	3.4	2.0	2.8	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 40	INTAKE (g)	27** B	27** B	26**B	21A	21A
	S.D.	2.2	2.1	2.1	2.1	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 42	INTAKE (g)	27** B	27** B	25**B	21A	22 A
	S.D.	1.7	2.3	3.0	2.9	0.0
	EFF. (g/kg)	80	81	77	76	67
	N	10	10	10	10	10
DAY 44	INTAKE (g)	27** B	27** B	26**B	21A	22 A
	S.D.	2.2	2.2	1.4	2.2	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 47	INTAKE (g)	28** B	27** B	26** AB	21A	21 A
	S.D.	1.7	2.0	2.3	1.9	0.3
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 49	INTAKE (g)	28** B	26**AB	26**AB	21 A	21 A
	S.D.	2.3	2.3	1.7	2.8	0.5
	EFF. (g/kg)	80	76	78	76	63
	N	10	10	10	10	10
DAY 51	INTAKE (g)	26** B	26** B	24**B	19 A	21 *A
	S.D.	2.2	2.7	2.2	2.7	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 54	INTAKE (g)	28** B	27** B	26** B	21A	20 A
	S.D.	2.1	2.2	2.3	3.2	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10

* P less than .05
** P less than .01
-- = Data Unavailable

Analysis of Variance using DUNCAN'S Procedure

A - Significance with control group (1-M)
B - Significance with pair Fed group (5-M)

SUMMARY OF DAILY MEAN FOOD CONSUMPTION (Grams)

STUDY: 4A2NT-M SEX: MALE

PERIOD	DOSE:(ppm) / GROUP:	0 1-M	500 2-M	1000 3-M	2000 4-M	0 5-M
DAY 56	INTAKE (g)	27**B	26** B	25** AB	21 A	20A
	S.D.	2.3	2.9	1.9	2.5	0.0
	EFF. (g/kg)	77	76	74	74	61
	N	10	10	10	10	10
DAY 58	INTAKE (g)	27**B	27** B	24** AB	20 A	20A
	S.D.	1.9	1.7	1.6	2.6	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 61	INTAKE (g)	27** B	27** B	24** AB	21 A	20A
	S.D.	1.3	2.0	1.9	1.8	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 63	INTAKE (g)	27**B	27** B	24** AB	21 A	21A
	S.D.	1.5	2.1	1.9	2.4	0.3
	EFF. (g/kg)	74	77	72	74	62
	N	10	10	10	10	10
DAY 65	INTAKE (g)	28**B	26** B	24** AB	19 A	21A
	S.D.	3.7	2.4	2.2	2.5	0.3
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 68	INTAKE (g)	27**B	26** B	24** AB	20 A	20A
	S.D.	1.4	2.1	1.7	1.9	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 70	INTAKE (g)	29**B	27** B	25** AB	22 A	20 A
	S.D.	1.5	2.4	2.2	1.4	0.3
	EFF. (g/kg)	77	76	74	77	60
	N	10	10	10	10	10
DAY 72	INTAKE (g)	25**B	26** B	23** AB	20 A	20A
	S.D.	2.1	2.1	2.3	2.2	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10

* P less than .05
** P less than .01
-- = Data Unavailable

Analysis of Variance using DUNCAN'S Procedure

A - Significance with control group (1-M)
B - Significance with pair Fed group (5-M)

SUMMARY OF DAILY MEAN FOOD CONSUMPTION (Grams)

STUDY: 4A2NT-M SEX: MALE PAGE: 5

PERIOD	DOSE:(ppm) / GROUP:	0 1-M	500 2-M	1000 3-M	2000 4-M	0 5-M	
DAY 75	INTAKE (g)	27** B	26** B	24**AB	21 A	21A	
	S.D.	1.8	1.8	2.1	2.7	0.4	
	EFF. (g/kg)	--	--	--	--	--	
	N	10	10	10	10	10	
DAY 77	INTAKE (g)	27** B	26** B	24**AB	21 A	21A	
	S.D.	2.1	1.8	1.7	2.5	0.3	
	EFF. (g/kg)	72	71	70	75	61	
	N	10	10	10	10	10	
DAY 79	INTAKE (g)	26**B	26** B	23**AB	21 A	21A	
	S.D.	1.6	2.0	2.3	2.5	0.3	
	EFF. (g/kg)	--	--	--	--	--	
	N	10	10	10	10	10	
DAY 82	INTAKE (g)	27** B	26** B	24**AB	20 A	21A	
	S.D.	1.7	2.3	2.0	2.2	0.0	
	EFF. (g/kg)	--	--	--	--	--	
	N	10	10	10	10	10	
DAY 83	INTAKE (g)	--	--	--	--	35	42/2 = 21g/day
	S.D.	0.0	0.0	0.0	0.0	4.0	
	EFF. (g/kg)	--	--	--	--	97	
	N	0	0	0	0	10	
DAY 84	INTAKE (g)	28**B	25** AB	23** A	22**A	7A	21g/day
	S.D.	1.3	1.4	1.6	2.3	3.9	
	EFF. (g/kg)	73	69	68	80	22	
	N	10	10	10	10	10	
DAY 86	INTAKE (g)	25**B	25** B	22 A	21 A	21A	
	S.D.	1.3	2.8	3.0	3.0	0.0	
	EFF. (g/kg)	--	--	--	--	--	
	N	10	10	10	10	10	
DAY 89	INTAKE (g)	27**B	23**	23**	20 A	20A	
	S.D.	1.4	6.9	2.3	3.9	0.0	
	EFF. (g/kg)	--	--	--	--	--	
	N	10	10	10	10	10	

* P less than .05
** P less than .01
-- = Data Unavailable

Analysis of Variance using DUNCAN'S Procedure

A - Significance with control group (1-M)
B - Significance with pair Fed group (5-M)

SUMMARY OF DAILY MEAN FOOD CONSUMPTION (Grams)

STUDY: 4A2NT-M SEX: MALE

PERIOD	DOSE:(ppm) / GROUP:	0 / 1-M	500 / 2-M	1000 / 3-M	2000 / 4-M	0 / 5-M
DAY 90	INTAKE (g)	25**B	24 * B	22 AB	20 A	20A
	S.D.	2.2	2.4	2.5	3.0	0.4
	EFF. (g/kg)	65	67	65	73	57
	N	10	10	10	10	10

* P less than .05
** P less than .01
-- = Data Unavailable

Analysis of Variance using DUNCAN'S Procedure

A - Significance with control group (1-M)
B - Significance with pair Fed group (5-M)

90-DAY FEEDING STUDY (FEMALE)
4-AMINO-2-NITROTOULENE
PROJECT 75-55-YJ81-91

SUMMARY OF DAILY MEAN FOOD CONSUMPTION (Grams)

STUDY: YJ8190F SEX: FEMALE

PERIOD	DOSE:(ppm) / GROUP:	0 / 1-F	500 / 2-F	1000 / 3-F	2000 / 4-F	0 / 5-F
DAY 2	INTAKE (g)	19**B	19**	18**	15 AB	17** A
	S.D.	2.0	1.8	1.1	2.8	1.6
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 5	INTAKE (g)	20**B	20** B	20**B	18**A	17A
	S.D.	1.9	1.9	1.7	2.2	1.1
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 7	INTAKE (g)	19	21	19	19	23
	S.D.	1.9	3.1	9.9	1.8	3.6
	EFF. (g/kg)	114	125	113	116	117
	N	10	10	10	10	10
DAY 9	INTAKE (g)	20** B	20** B	20**B	17**A	17A
	S.D.	1.8	2.2	2.2	1.6	1.1
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 12	INTAKE (g)	20**B	21** B	19**B	18**A	17A
	S.D.	1.9	2.0	1.8	1.7	0.3
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 14	INTAKE (g)	20**B	19** B	18**	16 A	16** A
	S.D.	1.6	2.9	3.4	3.1	1.6
	EFF. (g/kg)	109	105	100	93	85
	N	10	10	10	10	10
DAY 16	INTAKE (g)	19**B	20** B	19**B	16 A	17** A
	S.D.	2.2	1.6	1.9	2.3	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 19	INTAKE (g)	21**B	22** B	20**B	18**A	16A
	S.D.	1.6	2.6	2.9	1.8	1.9
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10

* P less than .05
** P less than .01

Analysis of Variance using DUNCAN'S Procedure

A - Significance with control group (1-F)

B - Significance with pair Fed group (5-F)

SUMMARY OF DAILY MEAN FOOD CONSUMPTION (Grams)

STUDY: YJ8190F SEX: FEMALE

PERIOD	DOSE:(ppm) GROUP:	0 1-F	500 2-F	1000 3-F	2000 4-F	0 5-F
DAY 21	INTAKE (g)	20 *B	21** B	21** B	18 A	18A
	S.D.	2.0	1.4	3.9	1.6	0.0
	EFF. (g/kg)	106	110	109	102	90
	N	10	10	10	10	10
DAY 23	INTAKE (g)	22**B	22** B	22** B	18 A	18A
	S.D.	2.7	2.9	2.6	1.9	0.3
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 26	INTAKE (g)	21**B	23** B	20 * B	19 A	18A
	S.D.	2.2	2.8	2.1	1.3	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 28	INTAKE (g)	21** B	22** B	22** B	18 A	18 A
	S.D.	2.4	2.9	2.0	1.7	0.3
	EFF. (g/kg)	105	109	110	100	89
	N	10	10	10	10	10
DAY 30	INTAKE (g)	21** B	22** B	20 * B	18 A	18 A
	S.D.	2.1	1.8	1.3	1.3	0.6
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 33	INTAKE (g)	21** B	23** B	22** B	18 A	18 A
	S.D.	3.2	2.6	2.2	1.4	0.3
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 35	INTAKE (g)	21 * B	22** B	21** B	18 A	18 A
	S.D.	2.6	2.1	1.6	1.1	0.6
	EFF. (g/kg)	98	104	103	98	86
	N	10	10	10	10	10
DAY 37	INTAKE (g)	22** B	22** B	21**AB	17 A	18 A
	S.D.	2.1	2.5	2.5	1.1	0.3
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10

* P less than .05
** P less than .01

Analysis of Variance using DUNCAN'S Procedure

A - Significance with control group (1-F)

B - Significance with pair Fed group (5-F)

SUMMARY OF DAILY MEAN FOOD CONSUMPTION (Grams)

STUDY: YJ8190F SEX: FEMALE PAGE: 3

PERIOD	DOSE:(ppm) / GROUP:	0 / 1-F	500 / 2-F	1000 / 3-F	2000 / 4-F	0 / 5-F
DAY 40	INTAKE (g)	20**B	21**B	20**B	17A	17A
	S.D.	2.7	2.1	1.5	1.0	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 42	INTAKE (g)	21**B	21**B	19 *AB	17A	17A
	S.D.	1.6	1.4	2.5	1.2	0.3
	EFF. (g/kg)	99	98	89	88	79
	N	10	10	10	10	10
DAY 44	INTAKE (g)	19 *B	21**B	19 *B	17A	17A
	S.D.	1.9	2.0	2.8	1.3	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 47	INTAKE (g)	21**B	22**B	20**B	17A	17A
	S.D.	1.9	1.9	1.7	0.9	0.3
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 49	INTAKE (g)	20**B	19 *B	17 A	17A	17A
	S.D.	2.3	1.4	3.2	1.4	0.5
	EFF. (g/kg)	90	88	82	90	81
	N	10	10	10	10	10
DAY 51	INTAKE (g)	18 *	19**B	18 *	16A	17A
	S.D.	1.8	1.8	1.4	1.5	0.3
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 54	INTAKE (g)	20**B	21**B	19**B	17A	16A
	S.D.	2.9	3.3	1.7	1.2	0.3
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 56	INTAKE (g)	19**B	21**B	20**B	17A	16A
	S.D.	1.8	2.4	2.1	1.3	0.6
	EFF. (g/kg)	88	94	91	90	77
	N	10	10	10	10	10

* P less than .05
** P less than .01

Analysis of Variance using DUNCAN'S Procedure

A - Significance with control group (1-F)
B - Significance with pair fed group (5-F)

SUMMARY OF DAILY MEAN FOOD CONSUMPTION (Grams)

STUDY: YJ8190F SEX: FEMALE

PERIOD	DOSE:(ppm) / GROUP:	0 1-F	500 2-F	1000 3-F	2000 4-F	0 5-F
DAY 58	INTAKE (g)	21** B	21** B	20** B	17 A	16 A
	S.D.	2.2	2.2	2.6	1.3	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 61	INTAKE (g)	20** B	20** B	19** B	17 A	17 A
	S.D.	1.3	1.6	1.4	1.4	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 63	INTAKE (g)	20** B	21** B	19 *	17 A	17 A
	S.D.	3.2	2.8	2.0	1.3	0.3
	EFF. (g/kg)	87	94	86	87	77
	N	10	10	10	10	10
DAY 65	INTAKE (g)	20** B	19**	19** B	16 A	17 A
	S.D.	1.8	3.6	2.4	0.9	0.3
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 68	INTAKE (g)	20** B	20** B	20** B	17 A	16 A
	S.D.	1.9	3.4	1.6	1.6	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 70	INTAKE (g)	21** B	20** B	19** B	17 A	17 A
	S.D.	2.6	2.5	1.4	1.2	0.3
	EFF. (g/kg)	92	87	88	89	77
	N	10	10	10	10	10
DAY 72	INTAKE (g)	20** B	21** B	19** B	16 A	17 A
	S.D.	2.4	3.9	2.1	1.8	0.5
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 75	INTAKE (g)	20** B	19** B	19** B	17 A	16 A
	S.D.	2.3	3.1	1.1	1.1	0.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10

* P less than .05
** P less than .01

Analysis of Variance using DUNCAN'S Procedure

A - Significance with control group (1-F)
B - Significance with pair fed group (5-F)

SUMMARY OF DAILY MEAN FOOD CONSUMPTION (Grams)

STUDY: YJ8190F SEX: FEMALE PAGE: 5

PERIOD	DOSE:(ppm) / GROUP:	0 / 1-F	500 / 2-F	1000 / 3-F	2000 / 4-F	0 / 5-F
DAY 77	INTAKE (g)	20** B	20** B	18 * B	17 A	16 A
	S.D.	1.8	2.9	2.1	1.1	0.6
	EFF. (g/kg)	84	87	83	86	74
	N	10	10	10	10	10
DAY 79	INTAKE (g)	19** B	19** B	19** B	16 A	16 A
	S.D.	2.9	2.7	2.3	1.5	0.3
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 82	INTAKE (g)	20** B	21** B	18** B	16 A	16 A
	S.D.	1.7	2.1	1.2	1.3	0.3
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 83	INTAKE (g)	--	--	--	--	28
	S.D.	0.0	0.0	0.0	0.0	5.1
	EFF. (g/kg)	--	--	--	--	118
	N	0	0	0	0	10
DAY 84	INTAKE (g)	18** B	19** B	19** B	16** A	5 A 16.5g
	S.D.	2.3	2.8	2.4	1.8	5.4
	EFF. (g/kg)	77	82	85	84	22
	N	10	10	10	10	10
DAY 86	INTAKE (g)	18** B	19** B	18** B	15 A	16 A
	S.D.	2.8	2.6	2.3	1.1	0.3
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 89	INTAKE (g)	19** B	20** B	19** B	16 A	16 A
	S.D.	1.9	1.9	1.4	1.1	1.0
	EFF. (g/kg)	--	--	--	--	--
	N	10	10	10	10	10
DAY 90	INTAKE (g)	19** B	19** B	17** AB	15 A	15 A
	S.D.	2.7	2.0	2.1	1.6	0.9
	EFF. (g/kg)	83	83	78	80	67
	N	10	10	10	10	10

* P less than .05 Analysis of Variance using DUNCAN'S Procedure
** P less than .01
-- = Data Unavailable

A - Significance with control group (1-F)
B - Significance with pair fed group (5-F)

SUMMARY OF DAILY MEAN FOOD CONSUMPTION (Grams)

STUDY: YJ8190F SEX: FEMALE

PERIOD	DOSE:(ppm) / GROUP:	0 1-F	500 2-F	1000 3-F	2000 4-F	0 5-F
DAY 91	INTAKE (g)	17	19	18	16	--
	S.D.	2.8	3.2	2.7	0.7	0.0
	EFF. (g/kg)	73	84	83	85	--
	N	10	10	10	10	0

* P less than .05 Analysis of Variance using DUNCAN'S Procedure
** P less than .01
-- = Data Unavailable

APPENDIX K

90-DAY FEEDING STUDY
4-AMINO-2-NITROTOLUENE
PROJECT 75-55-YJ81-91

SUMMARY OF BODY WEIGHTS (Grams)

STUDY: 4A2NT-M SEX: MALE

PERIOD	DOSE: (ppm) / GROUP:	0 1-M	500 2-M	1000 3-M	2000 4-M	0 5-M
DAY 0	MEAN	214 B	214 B	214 B	212 B	271** A
	S.D.	10.4	8.6	9.4	9.5	10.6
	N	10	10	10	10	10
DAY 7	MEAN	276**	276**	273**	250 AB	271**
	S.D.	13.8	10.7	12.2	12.7	11.3
	N	10	10	10	10	10
DAY 14	MEAN	333** B	326** B	323** B	276 AB	294** A
	S.D.	24.0	12.5	14.6	17.6	12.4
	N	10	10	10	10	10
DAY 21	MEAN	370** B	368** B	365** B	299 A	313** A
	S.D.	16.9	16.2	19.1	21.4	12.0
	N	10	10	10	10	10
DAY 28	MEAN	396** B	391** B	387** B	313 AB	336** A
	S.D.	19.9	20.5	24.6	19.0	10.8
	N	10	10	10	10	10
DAY 35	MEAN	427** B	417** B	409** B	326 AB	357** A
	S.D.	22.7	21.5	27.3	22.0	11.7
	N	10	10	10	10	10
DAY 42	MEAN	451** B	441** B	425** AB	337 AB	368** A
	S.D.	22.0	24.9	31.3	27.3	11.8
	N	10	10	10	10	10
DAY 49	MEAN	472** B	455** B	439** AB	344 AB	372** A
	S.D.	25.0	26.2	30.8	28.0	12.5
	N	10	10	10	10	10
DAY 56	MEAN	485** B	467** B	445** AB	343 AB	379** A
	S.D.	28.0	27.5	32.4	30.3	11.6
	N	10	10	10	10	10
DAY 63	MEAN	504** B	481** B	453** AB	343 AB	390** A
	S.D.	30.2	28.4	34.0	30.0	14.5
	N	10	10	10	10	10

* P less than .05
** P less than .01

Analysis of Variance using DUNCAN'S Procedure

A - Significance with control group (1-M)
B - Significance with pair fed group (5-M)

SUMMARY OF BODY WEIGHTS (Grams)

STUDY: 4A2NT-M SEX: MALE

PERIOD	DOSE: (ppm) / GROUP:	0 1-M	500 2-M	1000 3-M	2000 4-M	0 5-M
DAY 70	MEAN	519** B	489**AB	459**AB	340AB	397**A
	S.D.	30.4	29.8	37.0	33.1	14.6
	N	10	10	10	10	10
DAY 77	MEAN	531** B	499**AB	465** AB	344AB	406**A
	S.D.	33.4	30.8	37.6	33.4	13.2
	N	10	10	10	10	10
DAY 83	MEAN	--	--	--	--	448
	S.D.	--	--	--	--	17.2
	N	0	0	0	0	10
DAY 84	MEAN	542** B	505**AB	468** AB	342 AB	415**A
	S.D.	32.8	30.5	37.4	33.7	14.0
	N	10	10	10	10	10
DAY 90	MEAN	553** B	510**AB	470** AB	343AB	422**A
	S.D.	33.1	31.0	39.2	36.7	14.7
	N	10	10	10	10	10

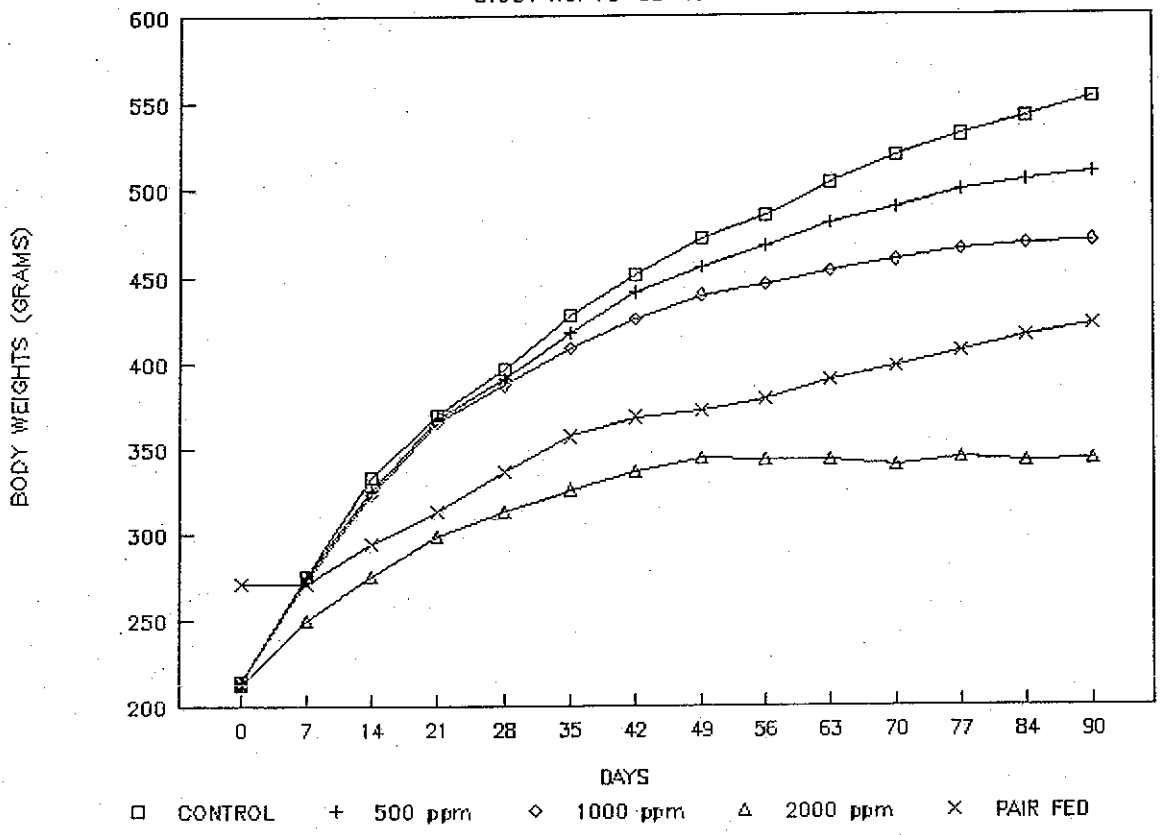
* P less than .05
** P less than .01
-- = Data Unavailable

Analysis of Variance using DUNCAN'S Procedure

A - Significance with control group (1-M)
B - Significance with pair Fed group (5-M)

MALE 90-DAY FEEDING STUDY

STUDY NO. 75-55-YJ81-91



90-DAY FEEDING STUDY (FEMALE)
4-AMINO-2-NITROTOULENE
PROJECT 75-55-YJ81-91

SUMMARY OF BODY WEIGHTS (Grams)

STUDY: YJ8190F SEX: FEMALE

PERIOD	DOSE: (ppm) / GROUP:	0 1-F	500 2-F	1000 3-F	2000 4-F	0 5-F
DAY 0	MEAN	148 B	148 B	152** B	149 B	181**
	S.D.	8.9	10.0	12.6	8.1	9.8
	N	10	10	10	10	10
DAY 7	MEAN	182** B	181** B	182** B	177 B	203**
	S.D.	12.2	8.6	9.3	8.1	14.4
	N	10	10	10	10	10
DAY 14	MEAN	208**	208**	204**	190 AB	202**
	S.D.	15.4	11.8	11.6	10.8	10.1
	N	10	10	10	10	10
DAY 21	MEAN	229** B	232** B	226** B	204 A	208** A
	S.D.	18.4	13.0	16.7	11.1	8.4
	N	10	10	10	10	10
DAY 28	MEAN	249** B	249** B	243** B	210 A	221** A
	S.D.	20.2	16.6	14.9	11.8	10.0
	N	10	10	10	10	10
DAY 35	MEAN	262** B	261** B	254** B	216 AB	231** A
	S.D.	24.2	16.0	16.7	12.5	7.7
	N	10	10	10	10	10
DAY 42	MEAN	278** B	273** B	261** B	221 A	234** A
	S.D.	28.6	16.4	19.8	11.8	6.8
	N	10	10	10	10	10
DAY 49	MEAN	284** B	279** B	265** B	226 A	240** A
	S.D.	26.6	17.6	19.9	12.2	6.8
	N	10	10	10	10	10
DAY 56	MEAN	287** B	287** B	270** B	227 A	242** A
	S.D.	23.1	17.4	21.7	11.9	8.7
	N	10	10	10	10	10
DAY 63	MEAN	298** B	295** B	277** B	230 A	247** A
	S.D.	28.4	22.6	21.7	12.6	7.6
	N	10	10	10	10	10

* P less than .05
** P less than .01

Analysis of Variance using DUNCAN'S Procedure

A - Significance from control
B - Significance from 5F (pair fed)

SUMMARY OF BODY WEIGHTS (Grams)

STUDY: YJ8190F SEX: FEMALE

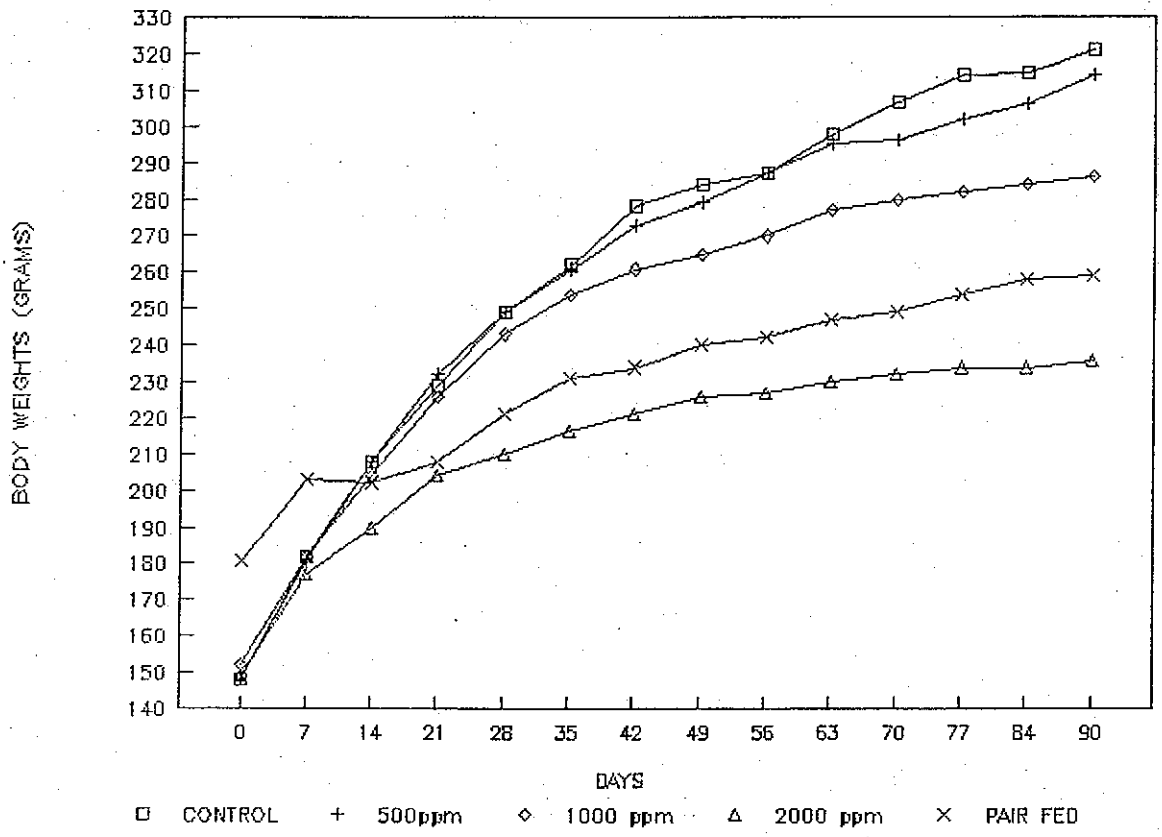
PERIOD	DOSE: (ppm) / GROUP:	0 / 1-F	500 / 2-F	1000 / 3-F	2000 / 4-F	0 / 5-F
DAY 70	MEAN	307**B	296** B	280** B	232 A	249** A
	S.D.	27.6	23.8	23.1	12.8	7.1
	N	10	10	10	10	10
DAY 77	MEAN	314** B	302** B	282** B	234 AB	254** A
	S.D.	28.1	22.3	25.1	12.0	6.4
	N	10	10	10	10	10
DAY 83	MEAN	--	--	--	--	282
	S.D.	--	--	--	--	12.0
	N	0	0	0	0	10
DAY 84	MEAN	315** B	306** B	284** B	234 AB	258** A
	S.D.	33.6	22.9	24.1	13.5	7.3
	N	10	10	10	10	10
DAY 90	MEAN	321** B	314** B	286** B	236 AB	259** A
	S.D.	29.6	22.6	25.9	12.7	8.6
	N	10	10	10	10	10
DAY 91	MEAN	323** B	315** B	289** B	237	--
	S.D.	31.1	23.7	26.4	12.9	--
	N	10	10	10	10	0

* P less than .05
** P less than .01
-- = Data Unavailable

Analysis of Variance using DUNCAN'S Procedure

A - Significance with control group (1-F)
B - Significance with pair Fed group (5-F)

FEMALE 90-DAY FEEDING STUDY BODY WEIGHT



SUMMARY OF DAILY WEIGHT GAINS (Grams)

STUDY: 4A2NT-M SEX: MALE

PERIOD	DOSE: (ppm) / GROUP:	0 1-M	500 2-M	1000 3-M	2000 4-M	0 5-M
DAY 7	MEAN	9** B	9**B	9** B	5** AB	-0 A
	S.D.	0.6	0.6	0.8	1.3	0.6
	N	10	10	10	10	10
DAY 14	MEAN	8** B	7**B	7** B	4 A	3 A
	S.D.	2.7	0.7	0.9	1.2	0.7
	N	10	10	10	10	10
DAY 21	MEAN	5** B	6**B	6** B	3 A	3 A
	S.D.	2.4	0.9	1.3	1.1	0.7
	N	10	10	10	10	10
DAY 28	MEAN	4**	3**	3**	2 AB	3**
	S.D.	0.8	0.7	1.1	1.2	0.4
	N	10	10	10	10	10
DAY 35	MEAN	4** B	4**	3** A	2 AB	3**A
	S.D.	0.9	0.6	1.7	0.8	0.3
	N	10	10	10	10	10
DAY 42	MEAN	4** B	3**B	2A	2 A	2 A
	S.D.	0.8	0.8	1.0	1.0	0.5
	N	10	10	10	10	10
DAY 49	MEAN	3** B	2** AB	2** AB	1 A	1 A
	S.D.	0.7	1.0	0.4	0.6	0.5
	N	10	10	10	10	10
DAY 56	MEAN	2**	2**	1**	-0 A	1**
	S.D.	0.6	1.1	0.7	1.1	0.3
	N	10	10	10	10	10
DAY 63	MEAN	3** B	2**A	1** A	-0 AB	2**A
	S.D.	0.6	0.8	0.8	0.9	0.8
	N	10	10	10	10	10
DAY 70	MEAN	2** B	1** A	1** A	-0 AB	1** A
	S.D.	0.3	0.6	0.9	1.2	0.5
	N	10	10	10	10	10

* P less than .05
** P less than .01

Analysis of Variance using DUNCAN'S Procedure

A - Significance with control group (1-M)
B - Significance with pair Fed group (5-M)

90-DAY FEEDING STUDY
4-AMINO-2-NITROTOLUENE
PROJECT 75-55-YJ81-91

SUMMARY OF DAILY WEIGHT GAINS (Grams)

STUDY: 4A2NT-M SEX: MALE

PERIOD	DOSE: (ppm) / GROUP:	0 1-M	500 2-M	1000 3-M	2000 4-M	0 5-M	
DAY 77	MEAN	2**	1 *	1 A	1 AB	1 *	
	S.D.	0.6	0.8	0.6	0.7	0.5	
	N	10	10	10	10	10	
DAY 83	MEAN	--	--	--	--	7	42/6 day
	S.D.	--	--	--	--	1.1	42-33 = 9g for 7 day
	N	0	0	0	0	10	
DAY 84	MEAN	2**	1**	0**	-0**	-33	-33/1 day 1.28/day
No significance	S.D.	0.7	0.7	0.5	0.8	6.7	
	N	10	10	10	10	10	
DAY 90	MEAN	2 *	1	0 A	0 A	1	
	S.D.	0.7	2.8	1.0	0.9	0.7	
	N	10	10	10	10	10	

* P less than .05
** P less than .01
-- = Data Unavailable

Analysis of Variance using DUNCAN'S Procedure

A - Significance with control group (1-M)
B - Significance with pair Fed group (5-M)

90-DAY FEEDING STUDY (FEMALE)
4-AMINO-2-NITROTOULENE
PROJECT 75-55-YJ81-91

SUMMARY OF DAILY WEIGHT GAINS (Grams)

STUDY: YJ8190F SEX: FEMALE

PERIOD	DOSE: (ppm) / GROUP:	0 / 1-F	500 / 2-F	1000 / 3-F	2000 / 4-F	0 / 5-F
DAY 7	MEAN	5** B	5** B	4	4	3 A
	S.D.	0.7	0.9	1.7	0.8	1.2
	N	10	10	10	10	10
DAY 14	MEAN	4** B	4** B	3**B	2** AB	-0 A
	S.D.	0.8	1.1	0.9	0.7	1.2
	N	10	10	10	10	10
DAY 21	MEAN	3** B	3** B	3**B	2 * AB	1 A
	S.D.	0.6	0.7	1.2	0.8	0.7
	N	10	10	10	10	10
DAY 28	MEAN	3**	2**	2**	1AB	2 *
	S.D.	1.7	1.1	1.1	0.6	0.6
	N	10	10	10	10	10
DAY 35	MEAN	2**	2 *	2 *	1A	1
	S.D.	1.2	1.1	0.7	0.4	0.7
	N	10	10	10	10	10
DAY 42	MEAN	2** B	2** B	1 A	1A	1 A
	S.D.	0.9	0.7	1.1	0.5	0.5
	N	10	10	10	10	10
DAY 49	MEAN	1	1	0	1	1
	S.D.	0.9	0.9	0.8	0.5	0.6
	N	10	10	10	10	10
DAY 56	MEAN	1	1 A↑B	1	0	0
	S.D.	1.0	0.6	0.7	0.8	0.5
	N	10	10	10	10	10
DAY 63	MEAN	2 * B	1 *	1	1	1
	S.D.	1.3	0.7	0.7	0.7	0.5
	N	10	10	10	10	10
DAY 70	MEAN	1** B	-0 A↓	1 * A	0 10	0 A
	S.D.	0.8	1.0	0.7	0.5	0.4
	N	10	10	10	10	10

* P less than .05
** P less than .01

Analysis of Variance using DUNCAN'S Procedure

A - Sig with control
B - Sig with group 5 (pair fed)

APPENDIX L

90-DAY FEEDING STUDY (FEMALE)
4-AMINO-2-NITROTOULENE
PROJECT 75-55-YJ81-91

SUMMARY OF DAILY WEIGHT GAINS (Grams)

STUDY: YJ8190F SEX: FEMALE PAGE: 2

PERIOD	DOSE: (ppm) / GROUP:	0 1-F	500 2-F	1000 3-F	2000 4-F	0 5-F	
DAY 77	MEAN	1 *	1 *	0 A	0	1	
	S.D.	0.7	1.1	0.8	0.4	0.3	
	N	10	10	10	10	10	
DAY 83	MEAN	--	--	--	--	5	6x5 = 30g/6 days
	S.D.	--	--	--	--	1.7	30-24 = 6g
	N	0	0	0	0	10	
DAY 84	MEAN	0**	1**	0**	-0**	-24 1g	
	S.D.	1.1	1.0	1.0	0.8	9.9	
	N	10	10	10	10	10	
DAY 90	MEAN	1 *B	1** B	0	0	0A	
	S.D.	1.0	1.0	1.1	0.8	0.6	
	N	10	10	10	10	10	
DAY 91	MEAN	2	2	3	1	--	
	S.D.	6.5	4.4	4.6	2.3	--	
	N	10	10	10	10	0	

* P less than .05
** P less than .01
-- = Data Unavailable

Analysis of Variance using DUNCAN'S Procedure

A - Significance with control group (1-F)
B - Significance with pair Fed group (5-F)

APPENDIX M

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CLINICAL CHEMISTRY
90 DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
MALE

DOSE		SGOT	SGPT	GLUCOSE	BUN	ALKPHOS
1 0ppm	mean	112.00	41.00	123.00	17.40	359.00
	std	18.50	7.10	14.80	1.80	80.00
	sem	5.85	2.25	4.68	0.57	25.30
2 *0ppm	mean	108.00	33.00	146.00	11.10 A	233.00
	std	74.90	6.40	29.00	2.10	90.00
	sem	23.69	2.02	9.17	0.66	28.46
3 500ppm	mean	106.00	35.00	125.00	17.60 B	258.00
	std	12.30	3.80	10.20	2.00	88.00
	sem	3.89	1.20	3.23	0.63	27.83
4 1000ppm	mean	122.00	47.00	150.00	17.00 B	296.00
	std	43.20	22.90	15.30	1.60	115.00
	sem	13.66	7.24	4.84	0.51	36.37
5 2000ppm	mean	121.00	50.00	195.00 AB	15.10 AB	400.00 B
	std	36.40	16.90	64.60	2.80	148.00
	sem	11.51	5.34	20.43	0.89	46.80

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE WITH GROUP 1 (CONTROL) p= 0.05
B- SIGNIFICANCE WITH GROUP 2 (RESTRICTED DIET) p= 0.05

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CLINICAL CHEMISTRY
90 DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
MALE

DOSE		T.BILI	CALCIUM	T. PRO	TRIG	CHOL
1 Oppm	mean	0.34	10.00	7.60	320.00	74.90
	std	0.27	0.31	0.28	48.30	10.60
	sem	0.09	0.10	0.09	15.27	3.35
2 *Oppm	mean	0.28	10.90	6.90 A	164.00 A	62.10
	std	0.05	0.47	0.40	26.10	6.90
	sem	0.02	0.15	0.13	8.25	2.18
3 500ppm	mean	0.40	9.70 B	7.20 B	295.00 B	71.80
	std	0.20	0.41	0.36	58.70	10.80
	sem	0.06	0.13	0.11	18.56	3.42
4 1000ppm	mean	0.53 B	10.70 A	7.70 B	324.00 B	93.50 AB
	std	0.17	0.48	0.40	80.70	15.80
	sem	0.05	0.15	0.13	25.52	5.00
5 2000ppm	mean	0.50 B	11.40 AB	7.50 B	464.00 AB	110.80 AB
	std	0.20	0.56	0.38	176.80	23.80
	sem	0.06	0.18	0.12	55.91	7.53

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE WITH GROUP 1 (CONTROL) p= 0.05
B- SIGNIFICANCE WITH GROUP 2 (RESTRICTED DIET) p= 0.05

CLINICAL CHEMISTRY
90-DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
FEMALE

DOSE		SGOT	SGPT	GLUCOSE	BUN	ALKPHOS
1 0ppm	mean	134.70	49.67	125.57	20.04	266.18
	std	42.08	20.57	7.81	2.39	81.25
	sem	13.31	6.50	2.47	0.76	25.69
2 *0ppm	mean	163.70	30.43 A	127.78	13.11 A	121.55 A
	std	168.87	13.72	23.01	3.49	54.62
	sem	53.40	4.34	7.28	1.10	17.27
3 500ppm	mean	105.50	44.07	119.05	18.32 B	216.05 B
	std	33.45	17.52	6.81	2.14	76.57
	sem	10.58	5.54	2.15	0.68	24.21
4 1000ppm	mean	82.20	30.95 A	131.17	17.16 AB	161.89 A
	std	16.33	5.17	15.43	2.11	44.87
	sem	5.16	1.63	4.88	0.67	14.19
5 2000ppm	mean	74.70	27.57 A	147.20 AB	16.83 AB	73.11 A
	std	18.79	5.23	9.50	2.55	148.00
	sem	5.94	1.65	3.00	0.81	46.80

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE FROM GROUP 1 (CONTROL) p= 0.05
B- SIGNIFICANCE FROM GROUP 2 (RESTRICTED DIET) p= 0.05

CLINICAL CHEMISTRY
90-DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
FEMALE

DOSE		T.BILI	CALCIUM	T.PRO	TRIG	CHOL
1 0ppm	mean	0.48	10.25	7.79	270.68	82.16
	std	0.17	0.60	0.60	48.28	7.23
	sem	0.05	0.19	0.19	15.27	2.29
2 *0ppm	mean	0.30	10.67	7.15	108.09 A	72.10
	std	0.08	0.27	0.49	25.53	14.76
	sem	0.03	0.09	0.15	8.07	4.67
3 500ppm	mean	0.46	10.51	7.65	282.84 B	84.97
	std	0.08	0.83	0.55	74.05	9.87
	sem	0.03	0.26	0.17	23.42	3.12
4 1000ppm	mean	0.53	10.95	7.49	203.37 B	80.99
	std	0.53	0.65	0.48	56.07	15.16
	sem	0.17	0.21	0.15	17.73	4.79
5 2000ppm	mean	1.12 AB	12.38 AB	7.84	471.63 AB	97.19 B
	std	1.18	0.68	0.59	146.93	23.45
	sem	0.37	0.22	0.19	46.46	7.42

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE FROM GROUP 1 (CONTROL) p= 0.05
B- SIGNIFICANCE FROM GROUP 2 (RESTRICTED DIET) p= 0.05

APPENDIX N

HEMATOLOGY
90 DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
MALE

DOSE		MCHC	MCH	HCT	MCV
1 0ppm	mean	35.2	17.9	43.6	50.8
	std	0.7	0.6	2.0	2.2
	sem	0.2	0.2	0.6	0.7
2 *0ppm	mean	35.4	18.1	44.5	51.0
	std	0.7	0.4	0.6	0.8
	sem	0.2	0.1	0.2	0.3
3 500ppm	mean	34.8	17.8	42.6	51.1
	std	0.6	0.6	2.2	2.0
	sem	0.2	0.2	0.7	0.6
4 1000ppm	mean	35.5	18.7 A	42.7	52.6
	std	1.2	0.8	2.0	1.8
	sem	0.4	0.2	0.6	0.6
5 2000ppm	mean	34.7	18.5 A	40.0 AB	53.5 AB
	std	0.7	0.6	4.6	2.2
	sem	0.2	0.2	1.5	0.7

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE WITH GROUP 1 (CONTROL) p= 0.05
B- SIGNIFICANCE WITH GROUP 2 (RESTRICTED DIET) p= 0.05

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HEMATOLOGY
90 DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
MALE

DOSE		PLT	WBC	RBC	HGB
1 0ppm	mean	1070.0	12.3	8.6	15.3
	std	117.9	3.2	0.4	0.5
	sem	37.3	1.0	0.1	0.2
5 *0ppm	mean	1093.0	6.9 A	8.7	15.8
	std	94.1	2.1	0.2	0.3
	sem	29.7	0.7	0.1	0.1
2 500ppm	mean	1060.0	15.0 B	8.4	14.8
	std	120.4	3.5	0.5	0.8
	sem	38.1	1.1	0.2	0.3
3 1000ppm	mean	1121.0	16.8 AB	8.1	15.1
	std	232.1	1.5	0.3	0.5
	sem	73.4	0.5	0.1	0.2
4 2000ppm	mean	1177.0	17.0 AB	7.5 AB	13.9 AB
	std	326.5	5.3	0.9	1.6
	sem	103.3	1.7	0.3	0.5

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE WITH GROUP 1 (CONTROL) p= 0.05
B- SIGNIFICANCE WITH GROUP 2 (RESTRICTED DIET) p= 0.05

HEMATOLOGY
90-DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
FEMALE

DOSE		PLT	WBC	RBC	HGB
1 0ppm	mean	1083	7.04	7.77	15.26
	std	151.4	2.3	0.3	0.5
	sem	47.9	0.7	0.1	0.1
2 *0ppm	mean	942.0	6.2	8.3 A	15.4 A
	std	355.1	2.8	0.4	0.7
	sem	112.3	0.9	0.1	0.2
3 500ppm	mean	911.0	8.0	7.5 B	14.8 B
	std	171.6	2.6	0.2	0.6
	sem	54.3	0.8	0.1	0.2
4 1000pp	mean	1120.0	8.8	7.2 AB	14.3 AB
	std	195.0	2.4	0.4	0.6
	sem	61.7	0.7	0.1	0.2
5 2000ppm	mean	1118.0	12.3 AB	6.5 AB	13.3 AB
	std	241.7	4.4	0.4	0.3
	sem	76.4	1.4	0.1	0.1

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE FROM GROUP 1 (CONTROL) p= 0.05
B- SIGNIFICANCE FROM GROUP 2 (RESTRICTED DIET) p= 0.05

HEMATOLOGY
90-DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
FEMALE

DOSE		MCH	MCV	HCT	MCHC
1 0ppm	mean	19.66	53.41	41.48	36.78
	std	0.5	1.3	1.5	0.5
	sem	0.2	0.4	0.5	0.2
2 *0ppm	mean	18.5 A	53.7	44.6 A	34.6
	std	0.5	1.6	2.3	0.8
	sem	0.2	0.5	0.7	0.2
3 500ppm	mean	19.8 B	55.1 B	41.1 B	36.0
	std	0.3	1.5	2.1	0.5
	sem	0.1	0.5	0.7	0.2
4 1000ppm	mean	19.8 B	56.0 AB	40.5 B	33.4
	std	0.8	1.9	2.8	6.7
	sem	0.3	0.6	0.9	2.1
5 2000ppm	mean	20.7 AB	57.6 AB	37.2 AB	35.9
	std	1.0	1.5	1.9	1.5
	sem	0.3	0.5	0.6	0.5

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE FROM GROUP 1 (CONTROL) p= 0.05
B- SIGNIFICANCE FROM GROUP 2 (RESTRICTED DIET) p= 0.05

APPENDIX O

ORGAN TO BRAIN WEIGHT RATIO
90 DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
MALE

DOSE		LIVER BRAIN	KIDNEY BRAIN	ADRENAL BRAIN	SPLEEN BRAIN	GONAD BRAIN
1 0ppm	mean	9.80	1.94	0.0450	0.40	1.64
	std	0.47	0.18	0.0200	0.07	0.08
	sem	0.15	0.06	0.0063	0.02	0.03
2 *0ppm	mean	6.20 A	1.59 A	0.0350	0.31 A	1.77
	std	0.47	0.10	0.0060	0.04	0.15
	sem	0.15	0.03	0.0019	0.01	0.05
3 500ppm	mean	10.70 B	1.90 B	0.0520	0.40 B	1.78
	std	1.17	0.23	0.0190	0.14	0.20
	sem	0.37	0.07	0.0060	0.04	0.06
4 1000ppm	mean	11.80 AB	1.92 B	0.0440	0.43 B	1.74
	std	1.60	0.22	0.0140	0.06	0.85
	sem	0.51	0.07	0.0044	0.02	0.27
5 2000ppm	mean	11.80 AB	2.00 B	0.0450	0.31 A	0.96 AB
	std	1.24	0.43	0.0190	0.04	0.22
	sem	0.39	0.14	0.0060	0.01	0.07

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE WITH GROUP 1 (CONTROL) p= 0.05
B- SIGNIFICANCE WITH GROUP 2 (RESTRICTED DIET) p= 0.05

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ORGAN TO BODY WEIGHT RATIO
90 DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
MALE

DOSE		KIDNEY BODY	GONAD BODY	SPLEEN BODY	LIVER BODY	ADRENAL BODY	BRAIN BODY
1 0ppm	mean	0.0075	0.0063	0.0016	0.0370	0.0002	0.0039
	std	0.0009	0.0002	0.0003	0.0016	0.0001	0.0002
	sem	0.0003	0.0001	0.0001	0.0005	0.0000	0.0001
2 *0ppm	mean	0.0077	0.0085	0.0015	0.0300 A	0.0002	0.0048 A
	std	0.0006	0.0007	0.0002	0.0022	0.0000	0.0001
	sem	0.0002	0.0002	0.0001	0.0007	0.0000	0.0000
3 500ppm	mean	0.0077	0.0072	0.0016	0.0440 AB	0.0002	0.0041 B
	std	0.0008	0.0004	0.0005	0.0036	0.0001	0.0003
	sem	0.0002	0.0001	0.0002	0.0011	0.0000	0.0001
4 1000ppm	mean	0.0088	0.0080	0.0020 AB	0.0550 AB	0.0002	0.0046 A
	std	0.0010	0.0040	0.0003	0.0086	0.0001	0.0004
	sem	0.0003	0.0013	0.0001	0.0027	0.0000	0.0001
5 2000ppm	mean	0.0124 AB	0.0059 B	0.0020 AB	0.0720 AB	0.0003 AB	0.0062 AB
	std	0.0034	0.0019	0.0002	0.0027	0.0001	0.0006
	sem	0.0011	0.0006	0.0001	0.0009	0.0000	0.0002

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE WITH GROUP 1 (CONTROL) p= 0.05
B- SIGNIFICANCE WITH GROUP 2 (RESTRICTED DIET) p= 0.05

ORGAN TO BRAIN WEIGHT RATIO
90-DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
FEMALE

DOSE		SPLEEN BRAIN	LIVER BRAIN	ADRENAL BRAIN	OVARIES BRAIN	KIDNEY BRAIN
1 0ppm	mean	0.31	5.94	0.0532	0.10	1.23
	std	0.03	0.71	0.0089	0.01	0.13
	sem	0.01	0.22	0.0028	0.00	0.04
2 *0ppm	mean	0.27	3.66 A	0.0388 A	0.08 A	1.02 A
	std	0.03	0.36	0.0068	0.01	0.06
	sem	0.01	0.11	0.0022	0.00	0.02
3 500ppm	mean	0.31	6.42 B	0.0518 B	0.10 B	1.23 B
	std	0.04	0.48	0.0083	0.02	0.08
	sem	0.01	0.15	0.0026	0.00	0.03
4 1000ppm	mean	0.34 B	7.10 AB	0.0561 B	0.10 B	1.33 B
	std	0.06	1.28	0.0080	0.01	0.30
	sem	0.02	0.40	0.0025	0.00	0.09
5 2000ppm	mean	0.30	7.56 AB	0.0427 A	0.09	1.23 B
	std	0.06	1.15	0.0047	0.02	0.11
	sem	0.02	0.36	0.0015	0.00	0.03

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE FROM GROUP 1 (CONTROL) p= 0.05
B- SIGNIFICANCE FROM GROUP 2 (RESTRICTED DIET) p= 0.05

ORGAN TO BODY WEIGHT RATIO
90-DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
FEMALE

DOSE		ADRENAL BODY	OVARIES BODY	SPLEEN BODY	LIVER BODY	KIDNEY BODY	BRAIN BODY
1 Oppm	mean	0.0003	0.0006	0.0019	0.0357	0.0074	0.0061
	std	0.0001	0.0001	0.0002	0.0032	0.0007	0.0002
	sem	0.0000	0.0000	0.0001	0.0010	0.0002	0.0001
2 *Oppm	mean	0.0003	0.0006	0.0020	0.0277 A	0.0077	0.0076 AB
	std	0.0001	0.0001	0.0002	0.0030	0.0005	0.0001
	sem	0.0000	0.0000	0.0001	0.0009	0.0002	0.0000
3 500ppm	mean	0.0003	0.0007	0.0020	0.0410 B	0.0078	0.0064 B
	std	0.0001	0.0001	0.0002	0.0022	0.0004	0.0003
	sem	0.0000	0.0000	0.0001	0.0007	0.0001	0.0001
4 1000ppm	mean	0.0004 B	0.0007	0.0023 AB	0.0492 AB	0.0093	0.0069 AB
	std	0.0001	0.0001	0.0004	0.0143	0.0033	0.0004
	sem	0.0000	0.0000	0.0001	0.0045	0.0010	0.0001
5 2000ppm	mean	0.0004	0.0008 AB	0.0025 AB	0.0631 AB	0.0103 AB	0.0083 AB
	std	0.0000	0.0002	0.0004	0.0126	0.0011	0.0006
	sem	0.0000	0.0000	0.0001	0.0040	0.0004	0.0002

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE FROM GROUP 1 (CONTROL) p= 0.05
B- SIGNIFICANCE FROM GROUP 2 (RESTRICTED DIET) p= 0.05

BODY WEIGHT, WEIGHT GAIN
90-DAY FEEDING STUDY
4-AMINO, 2-NITROTOLUENE (4A2NT)
STUDY NO. 55-YJ81-91
FEMALE

DOSE		FINAL BODY		WEIGHT GAIN
1 Oppm	mean	322.90		173.00
	std	31.15		
	sem	9.85		
2 *OPPM	mean	258.70	A	166.00
	std	8.60		
	sem	2.72		
3 500ppm	mean	315.40	B	134.00
	std	23.70		
	sem	7.49		
4 1000ppm	mean	289.30	AB	87.00
	std	26.40		
	sem	8.35		
5 2000ppm	mean	237.20	AB	78.00
	std	12.90		
	sem	4.08		

*- RESTRICTED DIET GROUP
A- SIGNIFICANCE FROM GROUP 1 (CONTROL) p= 0.05
B- SIGNIFICANCE FROM GROUP 2 (RESTRICTED DIET) p= 0.05

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US ARMY ENVIRONMENTAL HYGIENE AGENCY

4-AMINO, 2-NITROTOLUENE (4A2NT)
90-DAY FEEDING STUDY IN RATS

PROJECT NO. 55-YJ81-91

REPORT DATE: 04JUN93

SUBMITTED BY:

George A. Parker, DVM
Diplomate, American College
of Veterinary Pathologists

US ARMY ENVIRONMENTAL HYGIENE AGENCY

4-AMINO, 2-NITROTOLUENE (4A2NT)
90-DAY FEEDING STUDY IN RATS

PROJECT NO. 55-YJ81-91

GOOD LABORATORY PRACTICES COMPLIANCE STATEMENT

Histopathologic examination and those phases of microslide preparation completed by Biotechnics were performed in compliance with in-house Standard Operating Procedures; 21 CFR Part 58- Good Laboratory Practice for Nonclinical Laboratory Studies; 40 CFR Part 792- Toxic Substance Control Act (TSCA): Good Laboratory Practice Standards; and 40 CFR Part 160- Federal Insecticide, Fungicide and Rodenticide Act (FIFRA): Good Laboratory Practice Standards.

Catherine A. Picut VMD JD.

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Diplomate, American College
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US ARMY ENVIRONMENTAL HYGIENE AGENCY

4-AMINO, 2-NITROTOLUENE (4A2NT)
90-DAY FEEDING STUDY IN RATS

PROJECT NO. 55-YJ81-91

PATHOLOGY REPORT

TABLE OF CONTENTS

SPONSOR: US ARMY ENVIRONMENTAL HYGIENE AGENCY

MATERIAL: 4-amino, 2-NITROTOLUENE (4A2NT)

SUBJECT: Pathology Report

90-Day Feeding Study in Rats

USAEHA Project No. 55-YJ81-91

This narrative summarizes histopathologic findings in 100 Sprague-Dawley rats from a 90-day feeding study of 4-amino, 2-nitrotoluene (4A2NT).

METHODOLOGY

We received trimmed, formalin-fixed tissues in plastic process/embed cassettes that were labelled with the Pathology Branch accession number. Accompanying the tissues were trimming record sheets that listed the number of tissues that were trimmed, and a record of gross necropsy observations in each rat. The dosage groups were not known to the histopathologist until after the initial histopathologic examination was completed. After the initial histopathologic examination was completed, the study protocol revealed three treated groups, each consisting of 10 male and 10 female rats, that had received 500, 1000, or 2000 ppm of the test material in the feed. A group of 10 each male and female rats served as concurrent controls, and an additional group of 10 each male and female rats served as a second control group given a restricted diet that was quantitatively matched to the diet consumed by the 2000 ppm group.

The fixed tissue specimens were processed via standard histology techniques, embedded in paraffin, sectioned at approximately six microns, stained with hematoxylin and eosin, and examined via light microscopy. A

record of tissues examined and histopathologic findings were entered in a computer-assisted data retrieval system at the time of histopathologic examination. Tables generated from those entries constitute the basis for this narrative summary.

A small number of tissues were missing due to laboratory errors or sectioning difficulties. The number of missing tissues did not interfere with evaluation of the effects of compound administration. The microscopic sections were of adequate size and quality to allow critical histopathologic evaluation.

RESULTS

All animals survived to the scheduled termination of the study.

Males from the 1000 and 2000 ppm dosage groups had a moderate to high incidence of testicular hypospermatogenesis. The lesion consisted of reduction in spermatogenesis in a large number of seminiferous tubules, with many affected tubules containing only Sertoli cells. The lesion tended to be patchy within the testis, with some tubules severely affected and other tubules spared. Epididymides of affected testes often had a reduced content of maturing spermatozoa, which was recorded as hypospermia. Testes of two additional males from the 1000 ppm group had mild dilatation of seminiferous tubules. Testicular hypospermatogenesis and epididymal hypospermia are seen with some frequency as an incidental finding in laboratory rats, but the incidence pattern in this study indicates an association with administration of the test material.

All dosage groups except the restricted diet group had a high incidence of cytoplasmic vacuolization of hepatocytes, but the vacuolization was distinctly more pronounced in the treated males and somewhat more pronounced in the treated females. The change consisted of indistinctly bound cytoplasmic vacuoles, morphologically similar to postprandial glycogen and fat accumulation. In some rats the vacuolization was more prominent in the periportal region, while in others the change was distributed throughout the liver. Presence of the change in the control group suggests the vacuolization was due in part to postprandial accumulation of glycogen and fat, but the increased severity in rats that received the test material suggests compound-related accentuation of the change.

It would be helpful to perform stains for fat and glycogen on any remaining liver specimens, if further definition of the liver change is necessary. The hepatocellular changes may be associated with alterations in organ weights, and may be associated with increases in liver-related serum enzymes if the changes have advanced to the stage that cellular membranes are damaged or there is obstruction to bile outflow. Careful analysis of the organ weight and clinical pathology data is indicated to determine the extent and significance of the morphologic changes in the liver. Morphometric analysis of hepatocellular volume may also be indicated.

Males from the 1000 ppm group, and males and females from the 2000 ppm group, also had a low incidence of trace-level subacute inflammation in the liver. The lesion consisted of infiltrations of lymphocytes and a few neutrophils around biliary tracts. The lesion was judged to be of little clinical significance but, coupled with the vacuolization of hepatocytes, was interpreted as evidence of mild hepatotoxicity.

Males of the 2000 ppm group had a high incidence of cardiomyopathy, and a similar lesion was noted in the heart of 1/10 males from the 1000 ppm group. The lesion consisted of focal or multifocal degeneration of cardiac myofibers, often with a concurrent infiltration of lymphocytes and proliferation of Anitschkow myocytes. Cardiomyopathy is a common incidental finding in laboratory rats, particularly males, but usually is graded as trace-level in rats of this age. The incidence pattern and severity seen in this study suggest an association with compound administration in males.

Remaining lesions were considered to be incidental findings or part of spontaneous disease complexes of laboratory rats. Brief descriptive summaries of those lesions follows.

Microgranulomas in the liver consisted of focal or multifocal aggregations of lymphocytes and histiocytes. Lesions of this type are very common in laboratory rodents, and are suspected to be due to bacterial showering from the gastrointestinal tract.

Interstitial inflammation in the lung consisted of focal or multifocal thickening of alveoli with minimal associated lymphocytic infiltration, and sometimes included aggregations of alveolar macrophages. Lesions which consisted purely of alveolar macrophage aggregates were recorded as alveolar histiocytosis, though both types of lesions were considered to be part of the same pathologic process. Lesions of this type are commonly seen in laboratory rats, and may be due to aspiration of minor irritants or sialodacryoadenitis virus infection.

Embryonic remnants in the thyroid gland consisted of small, centrally located cystic structures that were lined by squamous epithelium. The structures are considered to be remnants of the thyroglossal duct system.

Cardiomyopathy consisted of degeneration of ventricular myofibers and an associated proliferation of endomysial fibrous connective tissue. Cardiomyopathy is a common incidental finding in laboratory rats, particularly males, but is of unknown pathogenesis.

Hydronephrosis is a common observation in the kidneys of laboratory rats, particularly in the right kidney, and may reflect a partial obstruction of the right ureter as it passes the great vessels in the lumbar region. There is evidence of a genetic influence on the incidence of hydronephrosis in laboratory rats.

Regeneration of renal tubular epithelium, interstitial inflammation, and accumulations of intratubular proteinic material are considered to be an early manifestation of spontaneous nephropathy syndrome, which is a very common spontaneous degenerative process of laboratory rats. The precise pathogenesis is unknown, but the incidence and severity are known to be influenced by protein content of the diet, total caloric content of the diet, and gender of the animals.

Subacute inflammation of the prostate consisted of focal or multifocal infiltrations of lymphocytes and a few neutrophils in the stroma of the prostate. Subacute prostatitis is a common incidental finding which has been attributed to various pathogens, but the precise pathogenesis remains largely unknown. One rat from the 2000 ppm group had severe chronic active inflammation of the prostate, which was considered to represent a severe manifestation of the spontaneous prostatitis seen in other rats.

Dilatation of the uterus, recorded as hydrometra in this study, is commonly seen in laboratory rats, and may represent a normal aspect of physiologic function.

Embryonic remnants in the pituitary gland consisted of small cystic cavities, some of which were lined by columnar epithelium. The lesions are compatible with cystic remnants of Rathke's pouch.

Spermatic granulomas were noted in the testis and epididymis of a small number of males. The lesions consisted of aggregations of spermatozoa surrounded by histiocytes. Changes of this type are a common incidental finding in young laboratory rats, and are presumed to be a result of "blind" testicular or epididymal ducts.

Focal or multifocal hemorrhage was noted in the thymus of a number of rats. Similar changes are commonly seen in both unscheduled and scheduled death animals, and are suspected to be agonal events. Small hemorrhages in the lung, heart, and pancreas were presumed to be of a similar pathogenesis. One male rat from the 2000 ppm group had severe renal hemorrhage and necrosis that were of unknown pathogenesis. The focal, unilateral nature of the lesion suggests it was not associated with administration of the test material.

Trace-level or mild subacute inflammation was noted in the pancreas of a small number of males. The lesions consisted of focal or multifocal infiltrations of lymphocytes and neutrophils, which were commonly located around pancreatic islets. The inflammation was considered to be an incidental finding, of uncertain pathogenesis.

The liver of one 2000 ppm male had mild focal coagulative necrosis. Lesions of this type are seen as an incidental finding in laboratory rats, therefore it was not possible to relate the single occurrence of hepatocellular necrosis to administration of the test material.

CONCLUSIONS

This regimen of 4-amino, 2-nitrotoluene (4A2NT) was associated with testicular hypospermatogenesis (atrophy) and associated depletion of spermatozoa in the epididymides of rats from the 1000 and 2000 ppm dosage groups. Males from the 2000 ppm dosage group had a high incidence of cardiomyopathy that was more severe than that commonly seen in male rats of this age, suggesting a compound-related accentuation of a spontaneous disease process. All groups except the restricted diet group, including the control group, had a high incidence of hepatocellular cytoplasmic vacuolization. The severity of the hepatocellular vacuolization, particularly in males, was associated with the dosage of 4A2NT, suggesting administration of the test material resulted in hepatocellular changes that were morphologically similar to postprandial accumulation of glycogen and fat.

SUBMITTED BY:

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Incidence of Histopathologic Findings for Males
US ARMY ENVIRONMENTAL HYGIENE AGENCY
90-DAY FEEDING STUDY OF 4-AMINO, 2-NITROTOLUENE IN RATS

Study Number: 55-YJ81-91

Species: Rat
This report was printed on 06-09-1993.

Tissue/ Diagnosis/ Modifier(s)	Group 1		Group 2		Group 3		Group 4	
	DOS	SAC	DOS	SAC	DOS	SAC	DOS	SAC
Total Animals	0	10	0	10	0	10	0	10
Adrenal Cortex	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Adrenal Medulla	(0)	(10)	(0)	(9)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	9	0	10	0	10
Aorta	(0)	(5)	(0)	(9)	(0)	(10)	(0)	(9)
Within Normal Limits	0	5	0	9	0	10	0	9
Bone Marrow, Femur	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Brain, Cerebellum	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Brain, Cerebrum	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Brain, Medulla Oblongata	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Brain, Midbrain	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Brain, Pons	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Duodenum	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Epididymis	(0)	(10)	(0)	(9)	(0)	(10)	(0)	(10)
Hypospermia	0	0	0	0	0	0	0	3
moderate	0	0	0	0	0	0	0	1
severe	0	0	0	0	0	0	0	2
Inflammation, granulomatous	0	0	0	0	0	0	0	1
moderate	0	0	0	0	0	0	0	1
Within Normal Limits	0	10	0	9	0	10	0	7
Esophagus	(0)	(9)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	9	0	10	0	10	0	10
Heart	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Cardiomyopathy	0	0	0	0	0	0	0	1
mild	0	0	0	0	0	0	0	1
Hemorrhage	0	0	0	1	0	0	0	0
mild	0	0	0	1	0	0	0	0
Within Normal Limits	0	10	0	9	0	10	0	9
Intestine	(0)	(9)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	9	0	10	0	10	0	10

Titles:
Group 1 0 PPM
Group 2 0 PPM/RESTRICTED DIET
Group 3 500 PPM
Group 4 1000 PPM
All modifiers are printed.

() = Total Examined
DOS= Intercurrent Death(s)
SAC= Scheduled Euthanasia

Study Number: 55-YJ81-91

Species: Rat
This report was printed on 06-09-1993.

Tissue/ Diagnosis/ Modifier(s)	Group 1		Group 2		Group 3		Group 4	
	DOS	SAC	DOS	SAC	DOS	SAC	DOS	SAC
Total Animals	0	10	0	10	0	10	0	10
Kidney	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Inflammation, interstitial	0	1	0	0	0	0	0	1
trace	0	1	0	0	0	0	0	1
Intratubular proteinic material	0	0	0	0	0	1	0	2
trace	0	0	0	0	0	1	0	2
Regeneration, tubular	0	1	0	1	0	3	0	3
trace	0	1	0	1	0	3	0	3
Within Normal Limits	0	8	0	9	0	7	0	6
Liver	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Cytoplasmic vacuolization	0	10	0	0	0	10	0	10
mild	0	8	0	0	0	2	0	0
moderate	0	2	0	0	0	8	0	10
Microgranuloma	0	2	0	3	0	6	0	5
trace	0	2	0	3	0	6	0	5
Within Normal Limits	0	0	0	7	0	0	0	0
Lung	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Alveolar histiocytosis	0	0	0	0	0	0	0	2
trace	0	0	0	0	0	0	0	2
Congestion	0	0	0	0	0	1	0	0
mild	0	0	0	0	0	1	0	0
Hemorrhage	0	0	0	3	0	0	0	1
trace	0	0	0	3	0	0	0	0
mild	0	0	0	0	0	0	0	1
Inflammation, interstitial	0	1	0	0	0	1	0	1
trace	0	1	0	0	0	1	0	1
Within Normal Limits	0	9	0	7	0	8	0	6
Lymph Node	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Nerve, Peripheral	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Pancreas	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Hemorrhage	0	0	0	0	0	1	0	0
trace	0	0	0	0	0	1	0	0
Inflammation, subacute	0	0	0	0	0	1	0	3
trace	0	0	0	0	0	1	0	2
moderate	0	0	0	0	0	0	0	1
Within Normal Limits	0	10	0	10	0	9	0	7

Titles:
Group 1 0 PPM
Group 2 0 PPM/RESTRICTED DIET
Group 3 500 PPM
Group 4 1000 PPM
All modifiers are printed.

() = Total Examined
DOS= Intercurrent Death(s)
SAC= Scheduled Euthanasia

Incidence of Histopathologic Findings for Males (continued)
US ARMY ENVIRONMENTAL HYGIENE AGENCY
90-DAY FEEDING STUDY OF 4-AMINO, 2-NITROTOLUENE IN RATS

Study Number: 55-YJ81-91

Species: Rat
This report was printed on 06-09-1993.

Tissue/ Diagnosis/ Modifier(s)	Group 1		Group 2		Group 3		Group 4	
	DOS	SAC	DOS	SAC	DOS	SAC	DOS	SAC
Total Animals	0	10	0	10	0	10	0	10
Parathyroid	(0)	(7)	(0)	(8)	(0)	(8)	(0)	(9)
Within Normal Limits	0	7	0	8	0	8	0	9
Pituitary	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Embryonic remnant	0	0	0	1	0	0	0	0
Within Normal Limits	0	10	0	9	0	10	0	10
Prostate	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Inflammation, subacute	0	3	0	4	0	3	0	2
trace	0	2	0	1	0	1	0	2
mild	0	1	0	3	0	1	0	0
moderate	0	0	0	0	0	1	0	0
Within Normal Limits	0	7	0	6	0	7	0	8
Salivary Gland	(0)	(10)	(0)	(10)	(0)	(9)	(0)	(10)
Within Normal Limits	0	10	0	10	0	9	0	10
Seminal Vesicle	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Skeletal Muscle	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Skin	(0)	(10)	(0)	(10)	(0)	(9)	(0)	(10)
Within Normal Limits	0	10	0	10	0	9	0	10
Spinal Cord	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Spleen	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Stomach, Glandular	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Stomach, Nonglandular	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Testis	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Dilatation, tubular	0	0	0	0	0	0	0	2
mild	0	0	0	0	0	0	0	2
Hypospermatogenesis	0	0	0	0	0	0	0	5
mild	0	0	0	0	0	0	0	1
moderate	0	0	0	0	0	0	0	2
severe	0	0	0	0	0	0	0	2
Within Normal Limits	0	10	0	10	0	10	0	4
Thymus	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Hemorrhage	0	4	0	7	0	6	0	4
trace	0	4	0	5	0	6	0	4
mild	0	0	0	2	0	0	0	0

Titles:
Group 1 0 PPM
Group 2 0 PPM/RESTRICTED DIET
Group 3 500 PPM
Group 4 1000 PPM
All modifiers are printed.

() = Total Examined
DOS= Intercurrent Death(s)
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Study Number: 55-YJ81-91

Species: Rat
This report was printed on 06-09-1993.

Tissue/ Diagnosis/ Modifier(s)	Group 1		Group 2		Group 3		Group 4	
	DOS	SAC	DOS	SAC	DOS	SAC	DOS	SAC
Total Animals	0	10	0	10	0	10	0	10
Thymus (continued)								
Within Normal Limits	0	6	0	3	0	4	0	6
Thyroid	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Embryonic remnant	0	1	0	2	0	2	0	1
Within Normal Limits	0	9	0	8	0	8	0	9
Tongue	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Trachea	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Urinary Bladder	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(9)
Within Normal Limits	0	10	0	10	0	10	0	9

Titles:
Group 1 0 PPM
Group 2 0 PPM/RESTRICTED DIET
Group 3 500 PPM
Group 4 1000 PPM
All modifiers are printed.

() = Total Examined
DOS= Intercurrent Death(s)
SAC= Scheduled Euthanasia

Study Number: 55-YJ81-91

Species: Rat
This report was printed on 06-09-1993.

Tissue/ Diagnosis/ Modifier(s)	Group 5 DOS	Group 5 SAC
Total Animals	0	10
Adrenal Cortex	(0)	(10)
Within Normal Limits	0	10
Adrenal Medulla	(0)	(10)
Within Normal Limits	0	10
Aorta	(0)	(7)
Within Normal Limits	0	7
Bone Marrow, Femur	(0)	(10)
Within Normal Limits	0	10
Brain, Cerebellum	(0)	(9)
Within Normal Limits	0	9
Brain, Cerebrum	(0)	(9)
Within Normal Limits	0	9
Brain, Medulla Oblongata	(0)	(9)
Within Normal Limits	0	9
Brain, Midbrain	(0)	(9)
Within Normal Limits	0	9
Brain, Pons	(0)	(9)
Within Normal Limits	0	9
Duodenum	(0)	(10)
Within Normal Limits	0	10
Epididymis	(0)	(10)
Granuloma, spermatic	0	1
moderate	0	1
Hypospermia	0	10
moderate	0	5
severe	0	5
Inflammation, subacute	0	1
trace	0	1
Esophagus	(0)	(10)
Within Normal Limits	0	10
Heart	(0)	(10)
Cardiomyopathy	0	8
trace	0	2
mild	0	6
Within Normal Limits	0	2
Intestine	(0)	(10)
Within Normal Limits	0	10

Titles:
Group 5 2000 PPM

() = Total Examined
DOS= Intercurrent Death(s)
SAC= Scheduled Euthanasia

All modifiers are printed.

Study Number: 55-YJ81-91

Species: Rat
This report was printed on 06-09-1993.

Tissue/ Diagnosis/ Modifier(s)	Group 5 DOS	Group 5 SAC
Total Animals	0	10
Kidney	(0)	(10)
Hemorrhage	0	1
severe	0	1
Hydronephrosis	0	2
moderate	0	2
Inflammation, interstitial	0	1
trace	0	1
Intratubular proteinic material	0	4
trace	0	4
Necrosis	0	1
severe	0	1
Regeneration, tubular	0	4
trace	0	4
Within Normal Limits	0	3
Liver	(0)	(10)
Cytoplasmic vacuolization	0	10
moderate	0	8
severe	0	2
Inflammation, subacute	0	6
trace	0	1
portal, trace	0	4
portal, mild	0	1
Microgranuloma	0	5
trace	0	5
Necrosis, coagulative	0	1
focal, mild	0	1
Lung	(0)	(10)
Alveolar histiocytosis	0	1
trace	0	1
Within Normal Limits	0	9
Lymph Node	(0)	(10)
Within Normal Limits	0	10
Nerve, Peripheral	(0)	(10)
Within Normal Limits	0	10
Pancreas	(0)	(10)
Inflammation, subacute	0	1
mild	0	1
Within Normal Limits	0	9

Titles:
Group 5 2000 PPM

() = Total Examined
DOS= Intercurrent Death(s)
SAC= Scheduled Euthanasia

All modifiers are printed.

Study Number: 55-YJ81-91

Species: Rat
This report was printed on 06-09-1993.

Tissue/ Diagnosis/ Modifier(s)	Group 5 DOS	Group 5 SAC
Total Animals	0	10
Parathyroid	(0)	(8)
Within Normal Limits	0	8
Pituitary	(0)	(9)
Within Normal Limits	0	9
Prostate	(0)	(10)
Inflammation, chronic active	0	1
severe	0	1
Inflammation, subacute	0	1
mild	0	1
Within Normal Limits	0	8
Salivary Gland	(0)	(10)
Within Normal Limits	0	10
Seminal Vesicle	(0)	(10)
Within Normal Limits	0	10
Skeletal Muscle	(0)	(10)
Within Normal Limits	0	10
Skin	(0)	(10)
Within Normal Limits	0	10
Spinal Cord	(0)	(10)
Within Normal Limits	0	10
Spleen	(0)	(10)
Inflammation, subacute	0	1
capsular, moderate	0	1
Within Normal Limits	0	9
Stomach, Glandular	(0)	(10)
Within Normal Limits	0	10
Stomach, Nonglandular	(0)	(10)
Within Normal Limits	0	10
Testis	(0)	(10)
Granuloma, spermatic	0	1
mild	0	1
Hypospermatogenesis	0	10
moderate	0	4
severe	0	6
Thymus	(0)	(10)
Hemorrhage	0	3
trace	0	3
Within Normal Limits	0	7

Titles:
Group 5 2000 PPM

() = Total Examined
DOS= Intercurrent Death(s)
SAC= Scheduled Euthanasia

All modifiers are printed.

Study Number: 55-YJ81-91

Species: Rat
This report was printed on 06-09-1993.

Tissue/ Diagnosis/ Modifier(s)	Group 5 DOS	Group 5 SAC
Total Animals	0	10
Thyroid	(0)	(10)
Embryonic remnant	0	2
Within Normal Limits	0	8
Tongue	(0)	(10)
Within Normal Limits	0	10
Trachea	(0)	(10)
Within Normal Limits	0	10
Urinary Bladder	(0)	(10)
Within Normal Limits	0	10

Titles:
Group 5 2000 PPM

() = Total Examined
DOS= Intercurrent Death(s)
SAC= Scheduled Euthanasia

All modifiers are printed.

Incidence of Histopathologic Findings for Females
US ARMY ENVIRONMENTAL HYGIENE AGENCY
90-DAY FEEDING STUDY OF 4-AMINO, 2-NITROTOLUENE IN RATS

Study Number: 55-YJ81-91

Species: Rat
This report was printed on 06-09-1993.

Tissue/ Diagnosis/ Modifier(s)	Group 1		Group 2		Group 3		Group 4	
	DOS	SAC	DOS	SAC	DOS	SAC	DOS	SAC
Total Animals	0	10	0	10	0	10	0	10
Adrenal Cortex	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Adrenal Medulla	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Aorta	(0)	(9)	(0)	(8)	(0)	(9)	(0)	(9)
Within Normal Limits	0	9	0	8	0	9	0	9
Bone Marrow, Femur	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Brain, Cerebellum	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Brain, Cerebrum	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Brain, Medulla Oblongata	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Brain, Midbrain	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Brain, Pons	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Duodenum	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Esophagus	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Eye	(0)	(0)	(0)	(0)	(0)	(1)	(0)	(1)
Within Normal Limits	0	0	0	0	0	1	0	1
Heart	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Intestine	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Kidney	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Intratubular proteinic material	0	0	0	0	0	0	0	1
mild	0	0	0	0	0	0	0	1
Regeneration, tubular	0	1	0	0	0	0	0	1
trace	0	1	0	0	0	0	0	0
mild	0	0	0	0	0	0	0	1
Within Normal Limits	0	9	0	10	0	10	0	9
Liver	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Cytoplasmic vacuolization	0	10	0	0	0	4	0	8
mild	0	8	0	0	0	2	0	1
moderate	0	2	0	0	0	2	0	7

Titles:
Group 1 0 PPM
Group 2 0 PPM/RESTRICTED DIET
Group 3 500 PPM
Group 4 1000 PPM
All modifiers are printed.

() = Total Examined
DOS= Intercurrent Death(s)
SAC= Scheduled Euthanasia

Study Number: 55-YJ81-91

Species: Rat
This report was printed on 06-09-1993.

Tissue/ Diagnosis/ Modifier(s)	Group 1		Group 2		Group 3		Group 4	
	DOS	SAC	DOS	SAC	DOS	SAC	DOS	SAC
Total Animals	0	10	0	10	0	10	0	10
Liver (continued)								
Inflammation, subacute	0	0	0	0	0	0	0	3
portal, trace	0	0	0	0	0	0	0	3
Microgranuloma	0	3	0	7	0	8	0	8
trace	0	3	0	7	0	8	0	8
Within Normal Limits	0	0	0	3	0	2	0	1
Lung	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Alveolar histiocytosis	0	0	0	1	0	0	0	0
trace	0	0	0	1	0	0	0	0
Within Normal Limits	0	10	0	9	0	10	0	10
Lymph Node	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Nerve, Peripheral	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Ovary	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Pancreas	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Parathyroid	(0)	(8)	(0)	(6)	(0)	(6)	(0)	(8)
Within Normal Limits	0	8	0	6	0	6	0	8
Pituitary	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Salivary Gland	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Skeletal Muscle	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Skin	(0)	(10)	(0)	(10)	(0)	(9)	(0)	(10)
Within Normal Limits	0	10	0	10	0	9	0	10
Spinal Cord	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Spleen	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Stomach, Glandular	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Mineralization	0	0	0	1	0	0	0	0
mild	0	0	0	1	0	0	0	0
Within Normal Limits	0	10	0	9	0	10	0	10
Stomach, Nonglandular	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10

Titles:
Group 1 0 PPM
Group 2 0 PPM/RESTRICTED DIET
Group 3 500 PPM
Group 4 1000 PPM
All modifiers are printed.

() = Total Examined
DOS= Intercurrent Death(s)
SAC= Scheduled Euthanasia

Study Number: 55-YJ81-91

Species: Rat
This report was printed on 06-09-1993.

Tissue/ Diagnosis/ Modifier(s)	Group 1		Group 2		Group 3		Group 4	
	DOS	SAC	DOS	SAC	DOS	SAC	DOS	SAC
Total Animals	0	10	0	10	0	10	0	10
Thymus	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Hemorrhage	0	3	0	8	0	6	0	3
trace	0	3	0	8	0	6	0	3
Within Normal Limits	0	7	0	2	0	4	0	7
Thyroid	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Embryonic remnant	0	0	0	0	0	1	0	2
Within Normal Limits	0	10	0	10	0	9	0	8
Tongue	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Trachea	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Urinary Bladder	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	10	0	10	0	10
Uterus	(0)	(10)	(0)	(10)	(0)	(10)	(0)	(10)
Hydrometra	0	0	0	3	0	2	0	2
trace	0	0	0	0	0	0	0	1
mild	0	0	0	3	0	2	0	0
moderate	0	0	0	0	0	0	0	1
Within Normal Limits	0	10	0	7	0	8	0	8
Vagina	(0)	(10)	(0)	(9)	(0)	(10)	(0)	(10)
Within Normal Limits	0	10	0	9	0	10	0	10

Titles:
Group 1 0 PPM
Group 2 0 PPM/RESTRICTED DIET
Group 3 500 PPM
Group 4 1000 PPM
All modifiers are printed.

() = Total Examined
DOS= Intercurrent Death(s)
SAC= Scheduled Euthanasia

Study Number: 55-YJ81-91

Species: Rat
This report was printed on 06-09-1993.

Tissue/ Diagnosis/ Modifier(s)	Group 5 DOS	Group 5 SAC
Total Animals	0	10
Adrenal Cortex	(0)	(10)
Within Normal Limits	0	10
Adrenal Medulla	(0)	(10)
Within Normal Limits	0	10
Aorta	(0)	(9)
Within Normal Limits	0	9
Bone Marrow, Femur	(0)	(10)
Within Normal Limits	0	10
Brain, Cerebellum	(0)	(10)
Within Normal Limits	0	10
Brain, Cerebrum	(0)	(10)
Within Normal Limits	0	10
Brain, Medulla Oblongata	(0)	(10)
Within Normal Limits	0	10
Brain, Midbrain	(0)	(10)
Within Normal Limits	0	10
Brain, Pons	(0)	(10)
Within Normal Limits	0	10
Duodenum	(0)	(10)
Within Normal Limits	0	10
Esophagus	(0)	(10)
Within Normal Limits	0	10
Heart	(0)	(10)
Within Normal Limits	0	10
Intestine	(0)	(10)
Within Normal Limits	0	10
Kidney	(0)	(10)
Intratubular proteinic material	0	1
mild	0	1
Regeneration, tubular	0	2
trace	0	1
mild	0	1
Within Normal Limits	0	8
Liver	(0)	(10)
Cytoplasmic vacuolization	0	10
mild	0	2
moderate	0	6
severe	0	2

Titles:
Group 5 2000 PPM

() = Total Examined
DOS= Intercurrent Death(s)
SAC= Scheduled Euthanasia

All modifiers are printed.

Study Number: 55-YJ81-91

Species: Rat
This report was printed on 06-09-1993.

Tissue/ Diagnosis/ Modifier(s)	Group 5 DOS	SAC
Total Animals	0	10
Liver (continued)		
Inflammation, subacute	0	2
portal, trace	0	2
Microgranuloma	0	9
trace	0	9
Lung	(0)	(10)
Alveolar histiocytosis	0	2
trace	0	2
Hemorrhage	0	1
trace	0	1
Within Normal Limits	0	7
Lymph Node	(0)	(10)
Sequestered blood	0	1
mild	0	1
Within Normal Limits	0	9
Nerve, Peripheral	(0)	(10)
Within Normal Limits	0	10
Ovary	(0)	(10)
Within Normal Limits	0	10
Pancreas	(0)	(10)
Within Normal Limits	0	10
Parathyroid	(0)	(8)
Within Normal Limits	0	8
Pituitary	(0)	(9)
Within Normal Limits	0	9
Salivary Gland	(0)	(10)
Within Normal Limits	0	10
Skeletal Muscle	(0)	(10)
Within Normal Limits	0	10
Skin	(0)	(9)
Within Normal Limits	0	9
Spinal Cord	(0)	(10)
Within Normal Limits	0	10
Spleen	(0)	(10)
Within Normal Limits	0	10
Stomach, Glandular	(0)	(10)
Mineralization	0	1
moderate	0	1

Titles:
Group 5 2000 PPM

() = Total Examined
DOS= Intercurrent Death(s)
SAC= Scheduled Euthanasia

All modifiers are printed.

Study Number: 55-YJ81-91

Species: Rat
This report was printed on 06-09-1993.

Tissue/ Diagnosis/ Modifier(s)	Group 5 DOS	Group 5 SAC
Total Animals	0	10
Stomach, Glandular (continued)		
Within Normal Limits	0	9
Stomach, Nonglandular	(0)	(10)
Within Normal Limits	0	10
Thymus	(0)	(10)
Hemorrhage	0	5
trace	0	5
Within Normal Limits	0	5
Thyroid	(0)	(10)
Embryonic remnant	0	2
Within Normal Limits	0	8
Tongue	(0)	(10)
Within Normal Limits	0	10
Trachea	(0)	(10)
Within Normal Limits	0	10
Urinary Bladder	(0)	(7)
Within Normal Limits	0	7
Uterus	(0)	(9)
Hydrometra	0	2
trace	0	1
mild	0	1
Within Normal Limits	0	7
Vagina	(0)	(9)
Within Normal Limits	0	9

Titles:
Group 5 2000 PPM

() = Total Examined
DOS= Intercurrent Death(s)
SAC= Scheduled Euthanasia

All modifiers are printed.

Project: 55-YJ81-91 Species: Rat
This report was printed on 06-09-1993.

The Legend to the Outline Report

****

X = Within Normal Limits
P = Present
C = Comment made
1 = Metastatic
2 = trace
3 = mild
4 = moderate
5 = severe
6 = present NG
7 = focal trace
8 = focal mild
9 = massive
10 =

() = Focal
<> = Multifocal
[] = Diffuse

SE = Scheduled Euthanasia
ME = Moribund Euthanasia
FD = Found Dead
OT = Other

Outline of Microscopic Observations
US ARMY ENVIRONMENTAL HYGIENE AGENCY
90-DAY FEEDING STUDY OF 4-AMINO, 2-NITROTOLUENE IN RATS

Project: 55-YJ81-91 Species: Rat Sex: Male Group: (1) 0 PPM

Organ/ Diagnosis	Animal Number	Fate	Death Day
	0 0 0 0 0 0 0 0 0 0	SE SE SE SE SE SE SE SE SE SE	90 90 90 90 90 90 90 90 90 90
Adrenal Cortex			
Within Normal Limits	X X X X X X X X X X		
Adrenal Medulla			
One of pair present	P P P P P P		
Within Normal Limits	X X X X X X X X X X		
Aorta			
Tissue Not Present	C C C C C		
Within Normal Limits	X X X X X		
Bone Marrow, Femur			
Within Normal Limits	X X X X X X X X X X		
Brain, Cerebellum			
Within Normal Limits	X X X X X X X X X X		
Brain, Cerebrum			
Within Normal Limits	X X X X X X X X X X		
Brain, Medulla Oblongata			
Within Normal Limits	X X X X X X X X X X		
Brain, Midbrain			
Within Normal Limits	X X X X X X X X X X		
Brain, Pons			
Within Normal Limits	X X X X X X X X X X		
Duodenum			
Within Normal Limits	X X X X X X X X X X		
Epididymis			
Within Normal Limits	X X X X X X X X X X		
Esophagus			
Tissue Not Present	C		
Within Normal Limits	X X X X X X X X X		
Heart			
Within Normal Limits	X X X X X X X X X X		
Intestine			
Tissue Not Present	C		
Within Normal Limits	X X X X X X X X X		

Project: 55-YJ81-91 Species: Rat Sex: Male Group: (1) 0 PPM

	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	2	2	2	2
	.	.	.	.	.	.	.	.	.	.
Animal Number:	0	0	0	0	0	0	0	0	0	0
	7	7	7	7	7	7	7	7	7	7
	1	1	1	1	1	1	1	2	2	2
	3	4	5	6	7	8	9	0	1	2
Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/ Diagnosis — Death Day:	9	9	9	9	9	9	9	9	9	9
	0	0	0	0	0	0	0	0	0	0
Kidney										
Inflammation, interstitial					2					
Regeneration, tubular										2
Within Normal Limits	X	X	X	X		X	X	X	X	
Liver										
Cytoplasmic vacuolization	3	3	3	4	3	3	3	3	4	3
Microgranuloma						2			2	
Lung										
Inflammation, interstitial										2
Within Normal Limits	X	X	X	X	X	X	X	X	X	
Lymph Node										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Nerve, Peripheral										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Pancreas										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Parathyroid										
Not in plane of section	C					C	C			
One of pair present		P		P	P				P	P
Within Normal Limits		X	X	X	X			X	X	X
Pituitary										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Prostate										
Inflammation, subacute	2	3						2		
Within Normal Limits			X	X	X	X	X		X	X
Salivary Gland										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Seminal Vesicle										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Skeletal Muscle										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Skin										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X

Project: 55-YJ81-91 Species: Rat Sex: Male Group: (1) 0 PPM

	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	2	2	2	2
	.	.	.	.	.	.	.	.	.	.
Animal Number:	0	0	0	0	0	0	0	0	0	0
	7	7	7	7	7	7	7	7	7	7
	1	1	1	1	1	1	1	2	2	2
	3	4	5	6	7	8	9	0	1	2
Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/ Diagnosis — Death Day:	9	9	9	9	9	9	9	9	9	9
	0	0	0	0	0	0	0	0	0	0
Spinal Cord										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Spleen										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Stomach, Glandular										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Stomach, Nonglandular										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Testis										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Thymus										
Hemorrhage	2						2		2	2
Within Normal Limits		X	X	X	X	X		X		
Thyroid										
Embryonic remnant										P
One of pair present	P					P				
Within Normal Limits	X	X	X	X	X	X	X	X	X	
Tongue										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Trachea										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Urinary Bladder										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X

Project: 55-YJ81-91 Species: Rat Sex: Male Group: (2) 0 PPM/RESTRICTED DIET

	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	2	2	2	2
	.	.	.	.	.	.	.	.	.	.
Animal Number:	0	0	0	0	0	0	0	0	0	0
	7	7	7	7	7	7	7	8	8	8
	9	9	9	9	9	9	9	0	0	0
	3	4	5	6	7	8	9	0	1	2
Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/ Death Day:	9	9	9	9	9	9	9	9	9	9
Diagnosis	0	0	0	0	0	0	0	0	0	0
Adrenal Cortex										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Adrenal Medulla										
Not in plane of section						C				
One of pair present	P			P			P			
Within Normal Limits	X	X	X	X	X		X	X	X	X
Aorta										
Tissue Not Present	C									
Within Normal Limits		X	X	X	X	X	X	X	X	X
Bone Marrow, Femur										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Brain, Cerebellum										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Brain, Cerebrum										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Brain, Medulla Oblongata										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Brain, Midbrain										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Brain, Pons										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Duodenum										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Epididymis										
Tissue Not Present						C				
Within Normal Limits	X	X	X	X	X		X	X	X	X
Esophagus										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Heart										
Hemorrhage							3			
Within Normal Limits	X	X	X	X	X	X		X	X	X
Intestine										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X

Project: 55-YJ81-91 Species: Rat Sex: Male Group: (2) 0 PPM/RESTRICTED DIET

		9	9	9	9	9	9	9	9	9	9
		2	2	2	2	2	2	2	2	2	2
		.	.	.	.	.	.	.	.	.	.
	Animal Number:	0	0	0	0	0	0	0	0	0	0
		7	7	7	7	7	7	7	8	8	8
		9	9	9	9	9	9	9	0	0	0
		3	4	5	6	7	8	9	0	1	2
	Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/ Diagnosis	Death Day:	9	9	9	9	9	9	9	9	9	9
		0	0	0	0	0	0	0	0	0	0
Kidney											
Regeneration, tubular								2			
Within Normal Limits		X	X	X	X	X	X		X	X	X
Liver											
Microgranuloma						2				2	2
Within Normal Limits		X	X	X	X		X	X	X		
Lung											
Hemorrhage		2		2				2			
Within Normal Limits			X		X	X	X		X	X	X
Lymph Node											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Nerve, Peripheral											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Pancreas											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Parathyroid											
Not in plane of section		C				C					
One of pair present			P						P		
Within Normal Limits			X	X	X		X	X	X	X	X
Pituitary											
Embryonic remnant							P				
Within Normal Limits		X	X	X	X	X		X	X	X	X
Prostate											
Inflammation, subacute		3		3			2				3
Within Normal Limits			X		X	X		X	X	X	
Salivary Gland											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Seminal Vesicle											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Skeletal Muscle											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Skin											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X

Project: 55-YJ81-91 Species: Rat Sex: Male Group: (2) 0 PPM/RESTRICTED DIET

	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	2	2	2	2
	.	.	.	.	.	.	.	.	.	.
Animal Number:	0	0	0	0	0	0	0	0	0	0
	7	7	7	7	7	7	7	8	8	8
	9	9	9	9	9	9	9	0	0	0
	3	4	5	6	7	8	9	0	1	2
Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/ Death Day:	9	9	9	9	9	9	9	9	9	9
Diagnosis	0	0	0	0	0	0	0	0	0	0
Spinal Cord										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Spleen										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Stomach, Glandular										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Stomach, Nonglandular										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Testis										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Thymus										
Hemorrhage	2	3	2				2	2	3	2
Within Normal Limits				X	X	X				
Thyroid										
Embryonic remnant				P			P			
Within Normal Limits	X	X	X		X	X		X	X	X
Tongue										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Trachea										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Urinary Bladder										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X

Project: 55-YJ81-91 Species: Rat Sex: Male Group: (3) 500 PPM

Organ/ Diagnosis	Animal Number	Fate	Death Day
	9 9 9 9 9 9 9 9 9 9		
	2 2 2 2 2 2 2 2 2 2		
	. . . .		
	0 0 0 0 0 0 0 0 0 0		
	7 7 7 7 7 7 7 7 7 7		
	2 2 2 2 2 2 2 3 3 3		
	3 4 5 6 7 8 9 0 1 2		
		SE SE SE SE SE SE SE SE SE SE	
			9 9 9 9 9 9 9 9 9 9
			0 0 0 0 0 0 0 0 0 0
Adrenal Cortex			
Within Normal Limits			X X X X X X X X X X
Adrenal Medulla			
One of pair present			P P P P
Within Normal Limits			X X X X X X X X X X
Aorta			
Within Normal Limits			X X X X X X X X X X
Bone Marrow, Femur			
Within Normal Limits			X X X X X X X X X X
Brain, Cerebellum			
Within Normal Limits			X X X X X X X X X X
Brain, Cerebrum			
Within Normal Limits			X X X X X X X X X X
Brain, Medulla Oblongata			
Within Normal Limits			X X X X X X X X X X
Brain, Midbrain			
Within Normal Limits			X X X X X X X X X X
Brain, Pons			
Within Normal Limits			X X X X X X X X X X
Duodenum			
Within Normal Limits			X X X X X X X X X X
Epididymis			
Within Normal Limits			X X X X X X X X X X
Esophagus			
Within Normal Limits			X X X X X X X X X X
Heart			
Within Normal Limits			X X X X X X X X X X
Intestine			
Within Normal Limits			X X X X X X X X X X
Kidney			
Intratubular proteinic material			2
Regeneration, tubular			2 2 2
Within Normal Limits			X X X X X X X X X

Project: 55-YJ81-91 Species: Rat Sex: Male Group: (3) 500 PPM

	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	2	2	2	2
	.	.	.	.	.	.	.	.	.	.
Animal Number:	0	0	0	0	0	0	0	0	0	0
	7	7	7	7	7	7	7	7	7	7
	2	2	2	2	2	2	2	3	3	3
	3	4	5	6	7	8	9	0	1	2
Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/ Death Day:	9	9	9	9	9	9	9	9	9	9
Diagnosis	0	0	0	0	0	0	0	0	0	0
Liver										
Cytoplasmic vacuolization	3	4	4	4	4	4	4	4	4	3
Microgranuloma	2	2			2	2		2	2	
Lung										
Congestion						3				
Inflammation, interstitial				2						
Within Normal Limits	X	X	X		X		X	X	X	X
Lymph Node										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Nerve, Peripheral										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Pancreas										
Hemorrhage	2									
Inflammation, subacute	2									
Within Normal Limits		X	X	X	X	X	X	X	X	X
Parathyroid										
Not in plane of section				C	C					
One of pair present	P	P	P				P	P	P	P
Within Normal Limits	X	X	X			X	X	X	X	X
Pituitary										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Prostate										
Inflammation, subacute	2		4						3	
Within Normal Limits		X		X	X	X	X	X		X
Salivary Gland										
Tissue Not Present	C									
Within Normal Limits		X	X	X	X	X	X	X	X	X
Seminal Vesicle										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Skeletal Muscle										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Skin										
Tissue Not Present	C									
Within Normal Limits		X	X	X	X	X	X	X	X	X

Outline of Microscopic Observations (continued)
US ARMY ENVIRONMENTAL HYGIENE AGENCY
90-DAY FEEDING STUDY OF 4-AMINO, 2-NITROTOLUENE IN RATS

Project: 55-YJ81-91 Species: Rat Sex: Male Group: (3) 500 PPM

Organ/ Diagnosis	Animal Number:	9 2 . 0 7 2 3	9 2 . 0 7 2 4	9 2 . 0 7 2 5	9 2 . 0 7 2 6	9 2 . 0 7 2 7	9 2 . 0 7 2 8	9 2 . 0 7 2 9	9 2 . 0 7 3 0	9 2 . 0 7 3 1	9 2 . 0 7 3 2
	Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
	Death Day:	9 0	9 0	9 0	9 0	9 0	9 0	9 0	9 0	9 0	9 0
Spinal Cord											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Spleen											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Stomach, Glandular											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Stomach, Nonglandular											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Testis											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Thymus											
Hemorrhage			2			2	2		2	2	2
Within Normal Limits		X		X	X			X			
Thyroid											
Embryonic remnant		P									P
One of pair present						P					
Within Normal Limits			X	X	X	X	X	X	X	X	
Tongue											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Trachea											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Urinary Bladder											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X

Project: 55-YJ81-91 Species: Rat Sex: Male Group: (4) 1000 PPM

		9 2 .	9 2 .	9 2 .	9 2 .	9 2 .	9 2 .	9 2 .	9 2 .	9 2 .	9 2 .
Animal Number:		0 7 3 3	0 7 3 4	0 7 3 5	0 7 3 6	0 7 3 7	0 7 3 8	0 7 3 9	0 7 4 0	0 7 4 1	0 7 4 2
	Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/ Diagnosis	Death Day:	9 0	9 0	9 0	9 0	9 0	9 0	9 0	9 0	9 0	9 0
Adrenal Cortex											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Adrenal Medulla											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Aorta											
Tissue Not Present									C		
Within Normal Limits		X	X	X	X	X	X	X		X	X
Bone Marrow, Femur											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Cerebellum											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Cerebrum											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Medulla Oblongata											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Midbrain											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Pons											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Duodenum											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Epididymis											
Hypospermia					4			5		5	
Inflammation, granulomatous								4			
Within Normal Limits		X	X	X		X	X		X		X
Esophagus											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Heart											
Cardiomyopathy					3						
Within Normal Limits		X	X	X		X	X	X	X	X	X
Intestine											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X

Project: 55-YJ81-91 Species: Rat Sex: Male Group: (4) 1000 PPM

	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	2	2	2	2
	.	.	.	.	.	.	.	.	.	.
Animal Number:	0	0	0	0	0	0	0	0	0	0
	7	7	7	7	7	7	7	7	7	7
	3	3	3	3	3	3	3	4	4	4
	3	4	5	6	7	8	9	0	1	2
Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/ Death Day:	9	9	9	9	9	9	9	9	9	9
Diagnosis	0	0	0	0	0	0	0	0	0	0
Kidney										
Inflammation, interstitial								2		
Intratubular proteinic material		2	2							
Regeneration, tubular		2			2			2		
Within Normal Limits	X			X		X	X		X	X
Liver										
Cytoplasmic vacuolization	4	4	4	4	4	4	4	4	4	4
Microgranuloma	2		2		2			2		2
Lung										
Alveolar histiocytosis									2	2
Hemorrhage	3									
Inflammation, interstitial					2					
Within Normal Limits		X	X	X		X	X	X		
Lymph Node										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Nerve, Peripheral										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Pancreas										
Inflammation, subacute		2		2			4			
Within Normal Limits	X		X		X	X		X	X	X
Parathyroid										
Not in plane of section					C					
One of pair present	P	P	P	P		P			P	
Within Normal Limits	X	X	X	X		X	X	X	X	X
Pituitary										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Prostate										
Inflammation, subacute	2			2						
Within Normal Limits		X	X		X	X	X	X	X	X
Salivary Gland										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Seminal Vesicle										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X

Project: 55-YJ81-91 Species: Rat Sex: Male Group: (4) 1000 PPM

		9	9	9	9	9	9	9	9	9	9
		2	2	2	2	2	2	2	2	2	2
		.	.	.	.	.	.	.	.	.	.
	Animal Number:	0	0	0	0	0	0	0	0	0	0
		7	7	7	7	7	7	7	7	7	7
		3	3	3	3	3	3	3	4	4	4
		3	4	5	6	7	8	9	0	1	2
	Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/	Death Day:	9	9	9	9	9	9	9	9	9	9
Diagnosis		0	0	0	0	0	0	0	0	0	0
Skeletal Muscle											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Skin											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Spinal Cord											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Spleen											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Stomach, Glandular											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Stomach, Nonglandular											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Testis											
Dilatation, tubular		3		3							
Hypospermatogenesis				3	4	4		5		5	
Within Normal Limits			X				X		X		X
Thymus											
Hemorrhage					2	2		2		2	
Within Normal Limits		X	X	X			X		X		X
Thyroid											
Embryonic remnant						P					
One of pair present		P									
Within Normal Limits		X	X	X	X		X	X	X	X	X
Tongue											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Trachea											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Urinary Bladder											
Tissue Not Present											C
Within Normal Limits		X	X	X	X	X	X	X	X		

Project: 55-YJ81-91 Species: Rat Sex: Male Group: (5) 2000 PPM

Organ/ Diagnosis	Animal Number									
	92203	92204	92205	92206	92207	92208	92209	92210	92211	92212
	074434	074444	074454	074464	074474	074484	074494	075504	075514	075525
Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Death Day:	90	90	90	90	90	90	90	90	90	90
Adrenal Cortex										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Adrenal Medulla										
One of pair present						P				P
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Aorta										
Tissue Not Present				C			C	C		
Within Normal Limits	X	X	X		X	X			X	X
Bone Marrow, Femur										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Brain, Cerebellum										
Tissue Not Present							C			
Within Normal Limits	X	X	X	X	X	X		X	X	X
Brain, Cerebrum										
Tissue Not Present							C			
Within Normal Limits	X	X	X	X	X	X		X	X	X
Brain, Medulla Oblongata										
Tissue Not Present							C			
Within Normal Limits	X	X	X	X	X	X		X	X	X
Brain, Midbrain										
Tissue Not Present							C			
Within Normal Limits	X	X	X	X	X	X		X	X	X
Brain, Pons										
Tissue Not Present							C			
Within Normal Limits	X	X	X	X	X	X		X	X	X
Duodenum										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Epididymis										
Granuloma, spermatic										4
Hypospermia	4	5	5	5	5	4	4	4	4	5
Inflammation, subacute						2				
One of pair present							P			

Project: 55-YJ81-91 Species: Rat Sex: Male Group: (5) 2000 PPM

	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	2	2	2	2
	.	.	.	.	.	.	.	.	.	.
Animal Number:	0	0	0	0	0	0	0	0	0	0
	7	7	7	7	7	7	7	7	7	7
	4	4	4	4	4	4	4	5	5	5
	3	4	5	6	7	8	9	0	1	2
Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/ Death Day:	9	9	9	9	9	9	9	9	9	9
Diagnosis	0	0	0	0	0	0	0	0	0	0
Esophagus										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Heart										
Cardiomyopathy	3	3	3	3	2	2	3			3
Within Normal Limits								X	X	
Intestine										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Kidney										
Hemorrhage									5	
Hydronephrosis		4		4						
Inflammation, interstitial			2							
Intratubular proteinic material			2	2				2	2	
Necrosis									5	
Regeneration, tubular	2		2		2			2		
Within Normal Limits						X	X			X
Liver										
Cytoplasmic vacuolization	5	5	4	4	4	4	4	4	4	4
Inflammation, subacute	2	2		2		3	2		2	
Microgranuloma		2	2	2	2					2
Necrosis, coagulative	(3)									
Lung										
Alveolar histiocytosis									2	
Within Normal Limits	X	X	X	X	X	X	X	X		X
Lymph Node										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Nerve, Peripheral										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Pancreas										
Inflammation, subacute								3		
Within Normal Limits	X	X	X	X	X	X	X		X	X
Parathyroid										
Not in plane of section				C		C				
One of pair present		P			P		P		P	
Within Normal Limits	X	X	X		X		X	X	X	X

Project: 55-YJ81-91 Species: Rat Sex: Male Group: (5) 2000 PPM

		9	9	9	9	9	9	9	9	9	9
		2	2	2	2	2	2	2	2	2	2
		.	.	.	.	.	.	.	.	.	.
	Animal Number:	0	0	0	0	0	0	0	0	0	0
		7	7	7	7	7	7	7	7	7	7
		4	4	4	4	4	4	4	5	5	5
		3	4	5	6	7	8	9	0	1	2
	Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/	Death Day:	9	9	9	9	9	9	9	9	9	9
Diagnosis		0	0	0	0	0	0	0	0	0	0
Pituitary											
Tissue Not Present							C				
Within Normal Limits		X	X	X	X	X		X	X	X	X
Prostate											
Inflammation, chronic active				5							
Inflammation, subacute					3						
Within Normal Limits		X	X			X	X	X	X	X	X
Salivary Gland											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Seminal Vesicle											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Skeletal Muscle											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Skin											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Spinal Cord											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Spleen											
Inflammation, subacute										4	
Within Normal Limits		X	X	X	X	X	X	X	X		X
Stomach, Glandular											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Stomach, Nonglandular											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Testis											
Granuloma, spermatic			3								
Hypospermatogenesis		4	5	5	5	5	4	4	4	5	5
Thymus											
Hemorrhage						2	2	2			
Within Normal Limits		X	X	X	X				X	X	X
Thyroid											
Embryonic remnant					P	P					
One of pair present							P				
Within Normal Limits		X	X	X			X	X	X	X	X

Project: 55-YJ81-91 Species: Rat Sex: Male Group: (5) 2000 PPM

		9	9	9	9	9	9	9	9	9	9
		2	2	2	2	2	2	2	2	2	2
		.	.	.	.	.	.	.	.	.	.
	Animal Number:	0	0	0	0	0	0	0	0	0	0
		7	7	7	7	7	7	7	7	7	7
		4	4	4	4	4	4	4	5	5	5
		3	4	5	6	7	8	9	0	1	2
	Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/	Death Day:	9	9	9	9	9	9	9	9	9	9
Diagnosis		0	0	0	0	0	0	0	0	0	0
Tongue		---	---	---	---	---	---	---	---	---	---
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Trachea		---	---	---	---	---	---	---	---	---	---
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Urinary Bladder		---	---	---	---	---	---	---	---	---	---
Within Normal Limits		X	X	X	X	X	X	X	X	X	X

Outline of Microscopic Observations
US ARMY ENVIRONMENTAL HYGIENE AGENCY
90-DAY FEEDING STUDY OF 4-AMINO, 2-NITROTOLUENE IN RATS

Project: 55-YJ81-91 Species: Rat
This report was printed on 06-09-1993.

The Legend to the Outline Report

****

X = Within Normal Limits
P = Present
C = Comment made
1 = Metastatic
2 = trace
3 = mild
4 = moderate
5 = severe
6 = present NG
7 = focal trace
8 = focal mild
9 = massive
10 =

() = Focal
<> = Multifocal
[] = Diffuse

SE = Scheduled Euthanasia
ME = Moribund Euthanasia
FD = Found Dead
OT = Other

Outline of Microscopic Observations
US ARMY ENVIRONMENTAL HYGIENE AGENCY
90-DAY FEEDING STUDY OF 4-AMINO, 2-NITROTOLUENE IN RATS

Project: 55-YJ81-91 Species: Rat Sex: Female Group: (1) 0 PPM

		9	9	9	9	9	9	9	9	9	9
		2	2	2	2	2	2	2	2	2	2
		.	.	.	.	.	.	.	.	.	.
	Animal Number:	0	0	0	0	0	0	0	0	0	0
		7	7	7	7	7	7	7	7	7	7
		5	5	5	5	5	5	5	6	6	6
		3	4	5	6	7	8	9	0	1	2
	Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/	Death Day:	9	9	9	9	9	9	9	9	9	9
Diagnosis		0	0	0	0	0	0	0	0	0	0
Adrenal Cortex											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Adrenal Medulla											
One of pair present		P	P				P				
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Aorta											
Tissue Not Present					C						
Within Normal Limits		X	X	X		X	X	X	X	X	X
Bone Marrow, Femur											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Cerebellum											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Cerebrum											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Medulla Oblongata											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Midbrain											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Pons											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Duodenum											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Esophagus											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Heart											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Intestine											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Kidney											
Regeneration, tubular									2		
Within Normal Limits		X	X	X	X	X	X	X		X	X
Liver											
Cytoplasmic vacuolization		3	3	3	3	3	3	4	3	3	4
Microgranuloma			2						2		2

Project: 55-YJ81-91 Species: Rat Sex: Female Group: (1) 0 PPM

	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	2	2	2	2
	.	.	.	.	.	.	.	.	.	.
Animal Number:	0	0	0	0	0	0	0	0	0	0
	7	7	7	7	7	7	7	7	7	7
	5	5	5	5	5	5	5	6	6	6
	3	4	5	6	7	8	9	0	1	2
Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/ Death Day:	9	9	9	9	9	9	9	9	9	9
Diagnosis	0	0	0	0	0	0	0	0	0	0
Lung										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Lymph Node										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Nerve, Peripheral										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Ovary										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Pancreas										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Parathyroid										
Not in plane of section			C				C			
One of pair present				P	P			P	P	P
Within Normal Limits	X	X		X	X	X		X	X	X
Pituitary										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Salivary Gland										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Skeletal Muscle										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Skin										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Spinal Cord										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Spleen										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Stomach, Glandular										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Stomach, Nonglandular										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Thymus										
Hemorrhage							2	2	2	
Within Normal Limits	X	X	X	X	X	X				X

Project: 55-YJ81-91 Species: Rat Sex: Female Group: (1) 0 PPM

	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	2	2	2	2
	.	.	.	.	.	.	.	.	.	.
Animal Number:	0	0	0	0	0	0	0	0	0	0
	7	7	7	7	7	7	7	7	7	7
	5	5	5	5	5	5	5	6	6	6
	3	4	5	6	7	8	9	0	1	2
Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/ Death Day:	9	9	9	9	9	9	9	9	9	9
Diagnosis	0	0	0	0	0	0	0	0	0	0
Thyroid	---	---	---	---	---	---	---	---	---	---
One of pair present								P		
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Tongue	---	---	---	---	---	---	---	---	---	---
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Trachea	---	---	---	---	---	---	---	---	---	---
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Urinary Bladder	---	---	---	---	---	---	---	---	---	---
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Uterus	---	---	---	---	---	---	---	---	---	---
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Vagina	---	---	---	---	---	---	---	---	---	---
Within Normal Limits	X	X	X	X	X	X	X	X	X	X

Project: 55-YJ81-91 Species: Rat Sex: Female Group: (2) 0 PPM/RESTRICTED DIET

Organ/ Diagnosis	Animal Number	Fate	Death Day
	9 9 9 9 9 9 9 9 9 9		
	2 2 2 2 2 2 2 2 2 2		
	. . . .		
	0 0 0 0 0 0 0 0 0 0		
	8 8 8 8 8 8 8 8 8 8		
	0 0 0 0 0 0 0 1 1 1		
	3 4 5 6 7 8 9 0 1 2		
	SE SE SE SE SE SE SE SE SE SE		
	9 9 9 9 9 9 9 9 9 9		
	0 0 0 0 0 0 0 0 0 0		
Adrenal Cortex			
Within Normal Limits	X X X X X X X X X X		
Adrenal Medulla			
One of pair present	P		
Within Normal Limits	X X X X X X X X X X		
Aorta			
Tissue Not Present	C C		
Within Normal Limits	X X X X X X X X		
Bone Marrow, Femur			
Within Normal Limits	X X X X X X X X X X		
Brain, Cerebellum			
Within Normal Limits	X X X X X X X X X X		
Brain, Cerebrum			
Within Normal Limits	X X X X X X X X X X		
Brain, Medulla Oblongata			
Within Normal Limits	X X X X X X X X X X		
Brain, Midbrain			
Within Normal Limits	X X X X X X X X X X		
Brain, Pons			
Within Normal Limits	X X X X X X X X X X		
Duodenum			
Within Normal Limits	X X X X X X X X X X		
Esophagus			
Within Normal Limits	X X X X X X X X X X		
Heart			
Within Normal Limits	X X X X X X X X X X		
Intestine			
Within Normal Limits	X X X X X X X X X X		
Kidney			
Within Normal Limits	X X X X X X X X X X		
Liver			
Microgranuloma	2 2 2 2 2 2 2		
Within Normal Limits	X X X X		

Project: 55-YJ81-91 Species: Rat Sex: Female Group: (2) 0 PPM/RESTRICTED DIET

	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	2	2	2	2
	.	.	.	.	.	.	.	.	.	.
Animal Number:	0	0	0	0	0	0	0	0	0	0
	8	8	8	8	8	8	8	8	8	8
	0	0	0	0	0	0	0	1	1	1
	3	4	5	6	7	8	9	0	1	2
Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/ Death Day:	9	9	9	9	9	9	9	9	9	9
Diagnosis	0	0	0	0	0	0	0	0	0	0
Lung										
Alveolar histiocytosis								2		
Within Normal Limits	X	X	X	X	X	X	X	X		X
Lymph Node										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Nerve, Peripheral										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Ovary										
One of pair present			P							
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Pancreas										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Parathyroid										
Not in plane of section		C						C	C	C
One of pair present	P			P		P	P			
Within Normal Limits	X		X	X	X	X	X			
Pituitary										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Salivary Gland										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Skeletal Muscle										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Skin										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Spinal Cord										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Spleen										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Stomach, Glandular										
Mineralization			3							
Within Normal Limits	X	X		X	X	X	X	X	X	X
Stomach, Nonglandular										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X

Project: 55-YJ81-91 Species: Rat Sex: Female Group: (2) 0 PPM/RESTRICTED DIET

		9	9	9	9	9	9	9	9	9	9
		2	2	2	2	2	2	2	2	2	2
		.	.	.	.	.	.	.	.	.	.
	Animal Number:	0	0	0	0	0	0	0	0	0	0
		8	8	8	8	8	8	8	8	8	8
		0	0	0	0	0	0	0	1	1	1
		3	4	5	6	7	8	9	0	1	2
	Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/	Death Day:	9	9	9	9	9	9	9	9	9	9
Diagnosis		0	0	0	0	0	0	0	0	0	0
Thymus											
Hemorrhage		2	2	2	2	2		2	2	2	
Within Normal Limits							X				X
Thyroid											
One of pair present			P		P			P		P	P
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Tongue											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Trachea											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Urinary Bladder											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Uterus											
Hydrometra				3			3		3		
Within Normal Limits		X	X		X	X		X		X	X
Vagina											
Tissue Not Present			C								
Within Normal Limits		X		X	X	X	X	X	X	X	X

Project: 55-YJ81-91 Species: Rat Sex: Female Group: (3) 500 PPM

		9	9	9	9	9	9	9	9	9	9
		2	2	2	2	2	2	2	2	2	2
		.	.	.	.	.	.	.	.	.	.
	Animal Number:	0	0	0	0	0	0	0	0	0	0
		7	7	7	7	7	7	7	7	7	7
		6	6	6	6	6	6	6	7	7	7
		3	4	5	6	7	8	9	0	1	2
	Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/	Death Day:	9	9	9	9	9	9	9	9	9	9
Diagnosis		0	0	0	0	0	0	0	0	0	0
Adrenal Cortex											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Adrenal Medulla											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Aorta											
Tissue Not Present					C						
Within Normal Limits		X	X	X		X	X	X	X	X	X
Bone Marrow, Femur											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Cerebellum											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Cerebrum											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Medulla Oblongata											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Midbrain											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Pons											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Duodenum											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Esophagus											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Eye											
Within Normal Limits					X						
Heart											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Intestine											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Kidney											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Liver											
Cytoplasmic vacuolization		3	4	3	4						
Microgranuloma		2	2	2	2		2	2	2	2	

Project: 55-YJ81-91 Species: Rat Sex: Female Group: (3) 500 PPM

		9	9	9	9	9	9	9	9	9	9
		2	2	2	2	2	2	2	2	2	2
		.	.	.	.	.	.	.	.	.	.
	Animal Number:	0	0	0	0	0	0	0	0	0	0
		7	7	7	7	7	7	7	7	7	7
		6	6	6	6	6	6	6	7	7	7
		3	4	5	6	7	8	9	0	1	2
	Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/	Death Day:	9	9	9	9	9	9	9	9	9	9
Diagnosis		0	0	0	0	0	0	0	0	0	0
Liver		---------- continued ----------									
Within Normal Limits						X					X
Lung		---									
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Lymph Node		---									
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Nerve, Peripheral		---									
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Ovary		---									
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Pancreas		---									
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Parathyroid		---									
Not in plane of section		C	C			C		C			
One of pair present				P			P			P	P
Within Normal Limits				X	X		X		X	X	X
Pituitary		---									
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Salivary Gland		---									
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Skeletal Muscle		---									
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Skin		---									
Tissue Not Present					C						
Within Normal Limits		X	X	X		X	X	X	X	X	X
Spinal Cord		---									
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Spleen		---									
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Stomach, Glandular		---									
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Stomach, Nonglandular		---									
Within Normal Limits		X	X	X	X	X	X	X	X	X	X

Project: 55-YJ81-91 Species: Rat Sex: Female Group: (3) 500 PPM

	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	2	2	2	2
	.	.	.	.	.	.	.	.	.	.
Animal Number:	0	0	0	0	0	0	0	0	0	0
	7	7	7	7	7	7	7	7	7	7
	6	6	6	6	6	6	6	7	7	7
	3	4	5	6	7	8	9	0	1	2
Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/ Death Day:	9	9	9	9	9	9	9	9	9	9
Diagnosis	0	0	0	0	0	0	0	0	0	0
Thymus										
Hemorrhage	2	2	2	2					2	2
Within Normal Limits					X	X	X	X		
Thyroid										
Embryonic remnant						P				
One of pair present			P							
Within Normal Limits	X	X	X	X	X		X	X	X	X
Tongue										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Trachea										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Urinary Bladder										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Uterus										
Hydrometra						3	3			
Within Normal Limits	X	X	X	X	X			X	X	X
Vagina										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X

Project: 55-YJ81-91 Species: Rat Sex: Female Group: (4) 1000 PPM

		9	9	9	9	9	9	9	9	9	9
		2	2	2	2	2	2	2	2	2	2
		.	.	.	.	.	.	.	.	.	.
	Animal Number:	0	0	0	0	0	0	0	0	0	0
		7	7	7	7	7	7	7	7	7	7
		7	7	7	7	7	7	7	8	8	8
		3	4	5	6	7	8	9	0	1	2
	Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/ Diagnosis	Death Day:	9 0	9 0	9 0	9 0	9 0	9 0	9 0	9 0	9 0	9 0
Adrenal Cortex											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Adrenal Medulla											
One of pair present							P		P		
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Aorta											
Tissue Not Present								C			
Within Normal Limits		X	X	X	X	X	X		X	X	X
Bone Marrow, Femur											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Cerebellum											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Cerebrum											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Medulla Oblongata											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Midbrain											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Pons											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Duodenum											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Esophagus											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Eye											
Within Normal Limits								X			
Heart											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Intestine											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Kidney											
Intratubular proteinic material				3							
Regeneration, tubular				3							
Within Normal Limits		X	X		X	X	X	X	X	X	X

Project: 55-YJ81-91 Species: Rat Sex: Female Group: (4) 1000 PPM

		9	9	9	9	9	9	9	9	9	9
		2	2	2	2	2	2	2	2	2	2
		.	.	.	.	.	.	.	.	.	.
	Animal Number:	0	0	0	0	0	0	0	0	0	0
		7	7	7	7	7	7	7	7	7	7
		7	7	7	7	7	7	7	8	8	8
		3	4	5	6	7	8	9	0	1	2
	Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/	Death Day:	9	9	9	9	9	9	9	9	9	9
Diagnosis		0	0	0	0	0	0	0	0	0	0
Liver											
Cytoplasmic vacuolization				4	3	4	4	4	4	4	4
Inflammation, subacute				2		2				2	
Microgranuloma			2	2	2		2	2	2	2	2
Within Normal Limits		X									
Lung											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Lymph Node											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Nerve, Peripheral											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Ovary											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Pancreas											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Parathyroid											
Not in plane of section		C							C		
One of pair present			P		P	P	P	P		P	
Within Normal Limits			X	X	X	X	X	X		X	X
Pituitary											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Salivary Gland											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Skeletal Muscle											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Skin											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Spinal Cord											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Spleen											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Stomach, Glandular											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X

Project: 55-YJ81-91 Species: Rat Sex: Female Group: (4) 1000 PPM

	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	2	2	2	2
	.	.	.	.	.	.	.	.	.	.
Animal Number:	0	0	0	0	0	0	0	0	0	0
	7	7	7	7	7	7	7	7	7	7
	7	7	7	7	7	7	7	8	8	8
	3	4	5	6	7	8	9	0	1	2
Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/ Death Day:	9	9	9	9	9	9	9	9	9	9
Diagnosis	0	0	0	0	0	0	0	0	0	0
Stomach, Nonglandular										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Thymus										
Hemorrhage							2	2		2
Within Normal Limits	X	X	X	X	X	X			X	
Thyroid										
Embryonic remnant								P	P	
One of pair present			P							
Within Normal Limits	X	X	X	X	X	X	X			X
Tongue										
One of pair present							P			
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Trachea										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Urinary Bladder										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Uterus										
Hydrometra			4			2				
Within Normal Limits	X	X		X	X		X	X	X	X
Vagina										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X

Project: 55-YJ81-91 Species: Rat Sex: Female Group: (5) 2000 PPM

		9	9	9	9	9	9	9	9	9	9
		2	2	2	2	2	2	2	2	2	2
		.	.	.	.	.	.	.	.	.	.
	Animal Number:	0	0	0	0	0	0	0	0	0	0
		7	7	7	7	7	7	7	7	7	7
		8	8	8	8	8	8	8	9	9	9
		3	4	5	6	7	8	9	0	1	2
	Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/ Diagnosis	Death Day:	9	9	9	9	9	9	9	9	9	9
		0	0	0	0	0	0	0	0	0	0
Adrenal Cortex											
One of pair present				P							
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Adrenal Medulla											
One of pair present				P	P		P	P			
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Aorta											
Tissue Not Present		C									
Within Normal Limits			X	X	X	X	X	X	X	X	X
Bone Marrow, Femur											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Cerebellum											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Cerebrum											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Medulla Oblongata											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Midbrain											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Brain, Pons											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Duodenum											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Esophagus											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Heart											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Intestine											
Within Normal Limits		X	X	X	X	X	X	X	X	X	X
Kidney											
Intratubular proteinic material								3			
Regeneration, tubular								3			2
Within Normal Limits		X	X	X	X	X	X	X		X	

Outline of Microscopic Observations (continued)
US ARMY ENVIRONMENTAL HYGIENE AGENCY
90-DAY FEEDING STUDY OF 4-AMINO, 2-NITROTOLUENE IN RATS

Project: 55-YJ81-91 Species: Rat Sex: Female Group: (5) 2000 PPM

	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	2	2	2	2
	.	.	.	.	.	.	.	.	.	.
Animal Number:	0	0	0	0	0	0	0	0	0	0
	7	7	7	7	7	7	7	7	7	7
	8	8	8	8	8	8	8	9	9	9
	3	4	5	6	7	8	9	0	1	2
Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/ Death Day:	9	9	9	9	9	9	9	9	9	9
Diagnosis	0	0	0	0	0	0	0	0	0	0
Liver										
Cytoplasmic vacuolization	4	4	4	4	3	3	4	5	5	4
Inflammation, subacute							2	2		
Microgranuloma	2	2	2	2		2	2	2	2	2
Lung										
Alveolar histiocytosis		2	2							
Hemorrhage					2					
Within Normal Limits	X			X		X	X	X	X	X
Lymph Node										
Sequestered blood				3						
Within Normal Limits	X	X	X		X	X	X	X	X	X
Nerve, Peripheral										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Ovary										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Pancreas										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Parathyroid										
Not in plane of section								C	C	
One of pair present	P		P		P	P				P
Within Normal Limits	X	X	X	X	X	X	X			X
Pituitary										
Tissue Not Present							C			
Within Normal Limits	X	X	X	X	X	X		X	X	X
Salivary Gland										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Skeletal Muscle										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Skin										
Tissue Not Present	C									
Within Normal Limits		X	X	X	X	X	X	X	X	X
Spinal Cord										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X

Project: 55-YJ81-91 Species: Rat Sex: Female Group: (5) 2000 PPM

	9	9	9	9	9	9	9	9	9	9
	2	2	2	2	2	2	2	2	2	2
	.	.	.	.	.	.	.	.	.	.
Animal Number:	0	0	0	0	0	0	0	0	0	0
	7	7	7	7	7	7	7	7	7	7
	8	8	8	8	8	8	8	9	9	9
	3	4	5	6	7	8	9	0	1	2
Fate:	SE	SE	SE	SE	SE	SE	SE	SE	SE	SE
Organ/ Diagnosis / Death Day:	9	9	9	9	9	9	9	9	9	9
	0	0	0	0	0	0	0	0	0	0
Spleen										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Stomach, Glandular										
Mineralization								4		
Within Normal Limits	X	X	X	X	X	X	X		X	X
Stomach, Nonglandular										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Thymus										
Hemorrhage			2	2		2	2			2
Within Normal Limits	X	X			X			X	X	
Thyroid										
Embryonic remnant		P								P
One of pair present			P						P	
Within Normal Limits	X		X	X	X	X	X	X	X	
Tongue										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Trachea										
Within Normal Limits	X	X	X	X	X	X	X	X	X	X
Urinary Bladder										
Tissue Not Present		C							C	C
Within Normal Limits	X		X	X	X	X	X	X		
Uterus										
Hydrometra				2					3	
Tissue Not Present		C								
Within Normal Limits	X		X		X	X	X	X		X
Vagina										
Tissue Not Present		C								
Within Normal Limits	X		X	X	X	X	X	X	X	X

Animal Number: 92.0713 Sex: Male Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 635

Microscopic Observations:

Esophagus	-Tissue Not Present
Intestine	-Tissue Not Present Cassette 9 contained brain sections.
Liver	-Cytoplasmic vacuolization, mild
Parathyroid	-Not in plane of section
Prostate	-Inflammation, subacute, trace
Thymus	-Hemorrhage, trace
Thyroid	-Within Normal Limits One of pair present

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Heart, Kidney, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0714 Sex: Male Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 658

Microscopic Observations:

Adrenal Medulla	-One of pair present Within Normal Limits
Aorta	-Tissue Not Present
Liver	-Cytoplasmic vacuolization, mild
Parathyroid	-One of pair present Within Normal Limits
Prostate	-Inflammation, subacute, mild

The following tissues were found to be within normal limits:
Adrenal Cortex, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0715 Sex: Male Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 638

Microscopic Observations:

Adrenal Medulla	-One of pair present
	Within Normal Limits
Liver	-Cytoplasmic vacuolization, mild

The following tissues were found to be within normal limits:
Adrenal Cortex, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Parathyroid, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0716 Sex: Male Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 629

Microscopic Observations:

Adrenal Medulla	-One of pair present
	Within Normal Limits
Liver	-Cytoplasmic vacuolization, moderate
Parathyroid	-One of pair present
	Within Normal Limits

The following tissues were found to be within normal limits:
Adrenal Cortex, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0717 Sex: Male Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 644

Microscopic Observations:

Kidney	-Inflammation, interstitial, trace
Liver	-Cytoplasmic vacuolization, mild
Parathyroid	-One of pair present
	Within Normal Limits

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum,

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Animal Number: 92.0717 Sex: Male Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 644

Microscopic Observations (continued):
The following tissues were found to be within normal limits (continued):
Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0718 Sex: Male Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 648

Microscopic Observations:

Adrenal Medulla	-One of pair present Within Normal Limits
Aorta	-Tissue Not Present
Liver	-Microgranuloma, trace Cytoplasmic vacuolization, mild
Parathyroid	-Not in plane of section
Thyroid	-One of pair present Within Normal Limits

The following tissues were found to be within normal limits:
Adrenal Cortex, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thymus, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0719 Sex: Male Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 699

Microscopic Observations:

Adrenal Medulla	-One of pair present Within Normal Limits
Aorta	-Tissue Not Present
Liver	-Cytoplasmic vacuolization, mild
Parathyroid	-Not in plane of section
Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart,

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Animal Number: 92.0719 Sex: Male Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 699

Microscopic Observations (continued):
The following tissues were found to be within normal limits (continued):
Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0720 Sex: Male Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 697

Microscopic Observations:

Adrenal Medulla	-One of pair present Within Normal Limits
Aorta	-Tissue Not Present
Liver	-Cytoplasmic vacuolization, mild
Prostate	-Inflammation, subacute, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Parathyroid, Pituitary, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0721 Sex: Male Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993.

Microscopic Observations:

Aorta	-Tissue Not Present
Liver	-Microgranuloma, trace Cytoplasmic vacuolization, moderate
Parathyroid	-One of pair present Within Normal Limits
Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0722 Sex: Male Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 708

Microscopic Observations:

Kidney	-Regeneration, tubular, trace
Liver	-Cytoplasmic vacuolization, mild
Lung	-Inflammation, interstitial, trace
Parathyroid	-One of pair present Within Normal Limits
Thymus	-Hemorrhage, trace
Thyroid	-Embryonic remnant

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0753 Sex: Female Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 760

Microscopic Observations:

Adrenal Medulla	-One of pair present Within Normal Limits
Liver	-Cytoplasmic vacuolization, mild

The following tissues were found to be within normal limits:
Adrenal Cortex, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Parathyroid, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0754 Sex: Female Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 713

Microscopic Observations:

Adrenal Medulla	-One of pair present Within Normal Limits
Liver	-Microgranuloma, trace Cytoplasmic vacuolization, mild

The following tissues were found to be within normal limits:
Adrenal Cortex, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum,

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Animal Number: 92.0754 Sex: Female Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 713

Microscopic Observations (continued):
The following tissues were found to be within normal limits (continued):
Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Parathyroid, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0755 Sex: Female Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 745

Microscopic Observations:

Liver	-Cytoplasmic vacuolization, mild
Parathyroid	-Not in plane of section

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0756 Sex: Female Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 744

Microscopic Observations:

Aorta	-Tissue Not Present
Liver	-Cytoplasmic vacuolization, mild
Parathyroid	-One of pair present
	Within Normal Limits

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0757 Sex: Female Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 783

Microscopic Observations:

Liver	-Cytoplasmic vacuolization, mild
Parathyroid	-One of pair present
	Within Normal Limits

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0758 Sex: Female Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 779

Microscopic Observations:

Adrenal Medulla	-One of pair present
	Within Normal Limits
Liver	-Cytoplasmic vacuolization, mild

The following tissues were found to be within normal limits:
Adrenal Cortex, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Parathyroid, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0759 Sex: Female Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 726

Microscopic Observations:

Liver	-Cytoplasmic vacuolization, moderate
Parathyroid	-Not in plane of section
Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0760 Sex: Female Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 722

Microscopic Observations:

Kidney	-Regeneration, tubular, trace
Liver	-Microgranuloma, trace
	Cytoplasmic vacuolization, mild
Parathyroid	-One of pair present
	Within Normal Limits
Thymus	-Hemorrhage, trace
Thyroid	-One of pair present
	Within Normal Limits

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0761 Sex: Female Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 729

Microscopic Observations:

Liver	-Cytoplasmic vacuolization, mild
Parathyroid	-One of pair present
	Within Normal Limits
Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0762 Sex: Female Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 756

Microscopic Observations:

Liver	-Microgranuloma, trace
	Cytoplasmic vacuolization, moderate
Parathyroid	-One of pair present
	Within Normal Limits

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum,

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Animal Number: 92.0762 Sex: Female Group: (1) 0 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 756

Microscopic Observations (continued):
The following tissues were found to be within normal limits (continued):
Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0793 Sex: Male Group: (2) 0 PPM/RESTRICTED DIET
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 637

Microscopic Observations:

Adrenal Medulla	-One of pair present Within Normal Limits
Aorta	-Tissue Not Present
Lung	-Hemorrhage, trace
Parathyroid	-Not in plane of section
Prostate	-Inflammation, subacute, mild
Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Kidney, Liver, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0794 Sex: Male Group: (2) 0 PPM/RESTRICTED DIET
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 639

Microscopic Observations:

Thymus	-Hemorrhage, mild

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Kidney, Liver, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Parathyroid, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0795 Sex: Male Group: (2) 0 PPM/RESTRICTED DIET
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 670

Microscopic Observations:

Lung	-Hemorrhage, trace
Parathyroid	-One of pair present Within Normal Limits
Prostate	-Inflammation, subacute, mild
Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Kidney, Liver, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0796 Sex: Male Group: (2) 0 PPM/RESTRICTED DIET
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 633

Microscopic Observations:

Adrenal Medulla	-One of pair present Within Normal Limits
Thyroid	-Embryonic remnant

The following tissues were found to be within normal limits:
Adrenal Cortex, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Kidney, Liver, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Parathyroid, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thymus, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0797 Sex: Male Group: (2) 0 PPM/RESTRICTED DIET
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 704

Microscopic Observations:

Liver	-Microgranuloma, trace
Parathyroid	-Not in plane of section

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular,

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Animal Number: 92.0797 Sex: Male Group: (2) 0 PPM/RESTRICTED DIET
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 704

Microscopic Observations (continued):
The following tissues were found to be within normal limits (continued):
Stomach, Nonglandular, Testis, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0798 Sex: Male Group: (2) 0 PPM/RESTRICTED DIET
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 650

Microscopic Observations:

Adrenal Medulla	-Not in plane of section
Epididymis	-Tissue Not Present
Pituitary	-Embryonic remnant
Prostate	-Inflammation, subacute, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Liver, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Parathyroid, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0799 Sex: Male Group: (2) 0 PPM/RESTRICTED DIET
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 682

Microscopic Observations:

Adrenal Medulla	-One of pair present Within Normal Limits
Heart	-Hemorrhage, mild
Kidney	-Regeneration, tubular, trace
Lung	-Hemorrhage, trace
Thymus	-Hemorrhage, trace
Thyroid	-Embryonic remnant

The following tissues were found to be within normal limits:
Adrenal Cortex, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Intestine, Liver, Lymph Node, Nerve, Peripheral, Pancreas, Parathyroid, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0800 Sex: Male Group: (2) 0 PPM/RESTRICTED DIET
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 636

Microscopic Observations:

Parathyroid	-One of pair present Within Normal Limits
Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Kidney, Liver, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0801 Sex: Male Group: (2) 0 PPM/RESTRICTED DIET
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 672

Microscopic Observations:

Liver	-Microgranuloma, trace
Thymus	-Hemorrhage, mild

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Parathyroid, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0802 Sex: Male Group: (2) 0 PPM/RESTRICTED DIET
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 631

Microscopic Observations:

Liver	-Microgranuloma, trace
Prostate	-Inflammation, subacute, mild
Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Parathyroid, Pituitary, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0803 Sex: Female Group: (2) 0 PPM/RESTRICTED DIET
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 773

Microscopic Observations:

Aorta	-Tissue Not Present
Liver	-Microgranuloma, trace
Parathyroid	-One of pair present Within Normal Limits
Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0804 Sex: Female Group: (2) 0 PPM/RESTRICTED DIET
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 789

Microscopic Observations:

Liver	-Microgranuloma, trace
Parathyroid	-Not in plane of section
Thymus	-Hemorrhage, trace
Thyroid	-One of pair present Within Normal Limits
Vagina	-Tissue Not Present

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Tongue, Trachea, Urinary Bladder, Uterus.

Animal Number: 92.0805 Sex: Female Group: (2) 0 PPM/RESTRICTED DIET
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 731

Microscopic Observations:

Liver	-Microgranuloma, trace
Ovary	-One of pair present Within Normal Limits
Stomach, Glandular	-Mineralization, mild
Thymus	-Hemorrhage, trace
Uterus	-Hydrometra, mild

Animal Number: 92.0805 Sex: Female Group: (2) 0 PPM/RESTRICTED DIET
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 731

Microscopic Observations (continued):

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Parathyroid, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Nonglandular, Thyroid, Tongue, Trachea, Urinary Bladder, Vagina.

Animal Number: 92.0806 Sex: Female Group: (2) 0 PPM/RESTRICTED DIET
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 716

Microscopic Observations:

Aorta	-Tissue Not Present
Liver	-Microgranuloma, trace
Parathyroid	-One of pair present Within Normal Limits
Thymus	-Hemorrhage, trace
Thyroid	-One of pair present Within Normal Limits

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0807 Sex: Female Group: (2) 0 PPM/RESTRICTED DIET
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 770

Microscopic Observations:

Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Liver, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Parathyroid, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0808 Sex: Female Group: (2) 0 PPM/RESTRICTED DIET
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 734

Microscopic Observations:

Liver	-Microgranuloma, trace
Parathyroid	-One of pair present
	Within Normal Limits
Uterus	-Hydrometra, mild

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder, Vagina.

Animal Number: 92.0809 Sex: Female Group: (2) 0 PPM/RESTRICTED DIET
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 790

Microscopic Observations:

Liver	-Microgranuloma, trace
Parathyroid	-One of pair present
	Within Normal Limits
Thymus	-Hemorrhage, trace
Thyroid	-One of pair present
	Within Normal Limits

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0810 Sex: Female Group: (2) 0 PPM/RESTRICTED DIET
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 769

Microscopic Observations:

Parathyroid	-Not in plane of section
Thymus	-Hemorrhage, trace
Uterus	-Hydrometra, mild

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum,

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Animal Number: 92.0810 Sex: Female Group: (2) 0 PPM/RESTRICTED DIET
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 769

Microscopic Observations (continued):
The following tissues were found to be within normal limits (continued):
Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Liver, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thyroid, Tongue, Trachea, Urinary Bladder, Vagina.

Animal Number: 92.0811 Sex: Female Group: (2) 0 PPM/RESTRICTED DIET
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 766

Microscopic Observations:

Liver	-Microgranuloma, trace
Lung	-Alveolar histiocytosis, trace
Parathyroid	-Not in plane of section
Thymus	-Hemorrhage, trace
Thyroid	-One of pair present
	Within Normal Limits

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0812 Sex: Female Group: (2) 0 PPM/RESTRICTED DIET
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 738

Microscopic Observations:

Adrenal Medulla	-One of pair present
	Within Normal Limits
Parathyroid	-Not in plane of section
Thyroid	-One of pair present
	Within Normal Limits

The following tissues were found to be within normal limits:
Adrenal Cortex, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Liver, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0723 Sex: Male Group: (3) 500 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 702

Microscopic Observations:

Liver	-Microgranuloma, trace
	Cytoplasmic vacuolization, mild
Pancreas	-Inflammation, subacute, trace
	Hemorrhage, trace
Parathyroid	-One of pair present
	Within Normal Limits
Prostate	-Inflammation, subacute, trace
Salivary Gland	-Tissue Not Present
Skin	-Tissue Not Present
Thyroid	-Embryonic remnant

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Pituitary, Seminal Vesicle, Skeletal Muscle, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thymus, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0724 Sex: Male Group: (3) 500 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 655

Microscopic Observations:

Liver	-Microgranuloma, trace
	Cytoplasmic vacuolization, moderate
Parathyroid	-One of pair present
	Within Normal Limits
Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0725 Sex: Male Group: (3) 500 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 669

Microscopic Observations:

Adrenal Medulla	-One of pair present Within Normal Limits
Kidney	-Intratubular proteinic material, trace Regeneration, tubular, trace
Liver	-Cytoplasmic vacuolization, moderate
Parathyroid	-One of pair present Within Normal Limits
Prostate	-Inflammation, subacute, moderate

The following tissues were found to be within normal limits:
Adrenal Cortex, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0726 Sex: Male Group: (3) 500 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 652

Microscopic Observations:

Adrenal Medulla	-One of pair present Within Normal Limits
Kidney	-Regeneration, tubular, trace
Liver	-Cytoplasmic vacuolization, moderate
Lung	-Inflammation, interstitial, trace
Parathyroid	-Not in plane of section

The following tissues were found to be within normal limits:
Adrenal Cortex, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0727 Sex: Male Group: (3) 500 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 689

Microscopic Observations:

Liver	-Microgranuloma, trace
	Cytoplasmic vacuolization, moderate
Parathyroid	-Not in plane of section
Thymus	-Hemorrhage, trace
Thyroid	-One of pair present
	Within Normal Limits

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0728 Sex: Male Group: (3) 500 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 646

Microscopic Observations:

Liver	-Cytoplasmic vacuolization, moderate
	Microgranuloma, trace
Lung	-Congestion, mild
Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Kidney, Lymph Node, Nerve, Peripheral, Pancreas, Parathyroid, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0729 Sex: Male Group: (3) 500 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 680

Microscopic Observations:

Kidney	-Regeneration, tubular, trace
Liver	-Cytoplasmic vacuolization, moderate
Parathyroid	-One of pair present
	Within Normal Limits

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum,

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Animal Number: 92.0729 Sex: Male Group: (3) 500 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 680

Microscopic Observations (continued):
The following tissues were found to be within normal limits (continued):
Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0730 Sex: Male Group: (3) 500 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 706

Microscopic Observations:

Liver	-Microgranuloma, trace Cytoplasmic vacuolization, moderate
Parathyroid	-One of pair present Within Normal Limits
Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0731 Sex: Male Group: (3) 500 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 712

Microscopic Observations:

Adrenal Medulla	-One of pair present Within Normal Limits
Liver	-Microgranuloma, trace Cytoplasmic vacuolization, moderate
Parathyroid	-One of pair present Within Normal Limits
Prostate	-Inflammation, subacute, mild
Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Salivary Gland,

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Animal Number: 92.0731 Sex: Male Group: (3) 500 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 712

Microscopic Observations (continued):
The following tissues were found to be within normal limits (continued):
Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0732 Sex: Male Group: (3) 500 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 703

Microscopic Observations:

Adrenal Medulla	-One of pair present Within Normal Limits
Liver	-Cytoplasmic vacuolization, mild
Parathyroid	-One of pair present Within Normal Limits
Thymus	-Hemorrhage, trace
Thyroid	-Embryonic remnant

The following tissues were found to be within normal limits:
Adrenal Cortex, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0763 Sex: Female Group: (3) 500 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 719

Microscopic Observations:

Liver	-Microgranuloma, trace Cytoplasmic vacuolization, mild
Parathyroid	-Not in plane of section
Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0764 Sex: Female Group: (3) 500 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 753

Microscopic Observations:

Liver	-Microgranuloma, trace
	Cytoplasmic vacuolization, moderate
Parathyroid	-Not in plane of section
Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0765 Sex: Female Group: (3) 500 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 718

Microscopic Observations:

Liver	-Microgranuloma, trace
	Cytoplasmic vacuolization, mild
Parathyroid	-One of pair present
	Within Normal Limits
Thymus	-Hemorrhage, trace
Thyroid	-One of pair present
	Within Normal Limits

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0766 Sex: Female Group: (3) 500 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 735

Microscopic Observations:

Aorta	-Tissue Not Present
Liver	-Microgranuloma, trace
	Cytoplasmic vacuolization, moderate
Skin	-Tissue Not Present
Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum,

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Animal Number: 92.0766 Sex: Female Group: (3) 500 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 735

Microscopic Observations (continued):
The following tissues were found to be within normal limits (continued):
Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Eye, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Parathyroid, Pituitary, Salivary Gland, Skeletal Muscle, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0767 Sex: Female Group: (3) 500 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 787

Microscopic Observations:

Parathyroid	-Not in plane of section

→ no spinal cord, bone marrow no slide, no block #12

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Liver, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0768 Sex: Female Group: (3) 500 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 759

2 - blocks & slides #12 (see 92.0767)

Microscopic Observations:

Liver	-Microgranuloma, trace
Parathyroid	-One of pair present
	Within Normal Limits
Thyroid	-Embryonic remnant
Uterus	-Hydrometra, mild

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Tongue, Trachea, Urinary Bladder, Vagina.

Animal Number: 92.0769 Sex: Female Group: (3) 500 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 724

Microscopic Observations:

Liver	-Microgranuloma, trace
Parathyroid	-Not in plane of section
Uterus	-Hydrometra, mild

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder, Vagina.

Animal Number: 92.0770 Sex: Female Group: (3) 500 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 749

Microscopic Observations:

Liver	-Microgranuloma, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Parathyroid, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0771 Sex: Female Group: (3) 500 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 755

Microscopic Observations:

Liver	-Microgranuloma, trace
Parathyroid	-One of pair present Within Normal Limits
Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0772 Sex: Female Group: (3) 500 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 742

Microscopic Observations:

Parathyroid	-One of pair present
	Within Normal Limits
Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Liver, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0733 Sex: Male Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 642

Microscopic Observations:

Liver	-Cytoplasmic vacuolization, moderate
	Microgranuloma, trace
Lung	-Hemorrhage, mild
Parathyroid	-One of pair present
	Within Normal Limits
Prostate	-Inflammation, subacute, trace
Testis	-Dilatation, tubular, mild
Thyroid	-One of pair present
	Within Normal Limits

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Kidney, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0734 Sex: Male Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 694

Microscopic Observations:

Kidney	-Intratubular proteinic material, trace
	Regeneration, tubular, trace
Liver	-Cytoplasmic vacuolization, moderate
Pancreas	-Inflammation, subacute, trace
Parathyroid	-One of pair present
	Within Normal Limits

Animal Number: 92.0734 Sex: Male Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 694

Microscopic Observations (continued):

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Lung, Lymph Node, Nerve, Peripheral, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0735 Sex: Male Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 662

Microscopic Observations:

Kidney	-Intratubular proteinic material, trace
Liver	-Microgranuloma, trace
	Cytoplasmic vacuolization, moderate
Parathyroid	-One of pair present
	Within Normal Limits
Testis	-Dilatation, tubular, mild
	Hypospermatogenesis, mild

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0736 Sex: Male Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 701

Microscopic Observations:

Epididymis	-Hypospermia, moderate
Heart	-Cardiomyopathy, mild
Liver	-Cytoplasmic vacuolization, moderate
Pancreas	-Inflammation, subacute, trace
Parathyroid	-One of pair present
	Within Normal Limits
Prostate	-Inflammation, subacute, trace
Testis	-Hypospermatogenesis, moderate
Thymus	-Hemorrhage, trace

Animal Number: 92.0736 Sex: Male Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 701

Microscopic Observations (continued):

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Pituitary, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0737 Sex: Male Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 656

Microscopic Observations:

Kidney	-Regeneration, tubular, trace
Liver	-Cytoplasmic vacuolization, moderate
	Microgranuloma, trace
Lung	-Inflammation, interstitial, trace
Parathyroid	-Not in plane of section
Testis	-Hypospermatogenesis, moderate
Thymus	-Hemorrhage, trace
Thyroid	-Embryonic remnant

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0738 Sex: Male Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 681

Microscopic Observations:

Liver	-Cytoplasmic vacuolization, moderate
Parathyroid	-One of pair present
	Within Normal Limits

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart,

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Animal Number: 92.0738 Sex: Male Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 681

Microscopic Observations (continued):
The following tissues were found to be within normal limits (continued):
Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0739 Sex: Male Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 688

Microscopic Observations:

Epididymis	-Hypospermia, severe
	Inflammation, granulomatous, moderate
Liver	-Cytoplasmic vacuolization, moderate
Pancreas	-Inflammation, subacute, moderate
Testis	-Hypospermatogenesis, severe
Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Parathyroid, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0740 Sex: Male Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 640

Microscopic Observations:

Aorta	-Tissue Not Present
Kidney	-Inflammation, interstitial, trace
	Regeneration, tubular, trace
Liver	-Microgranuloma, trace
	Cytoplasmic vacuolization, moderate

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Parathyroid, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0741 Sex: Male Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 654

Microscopic Observations:

Epididymis	-Hypospermia, severe
Liver	-Cytoplasmic vacuolization, moderate
Lung	-Alveolar histiocytosis, trace
Parathyroid	-One of pair present
	Within Normal Limits
Testis	-Hypospermatogenesis, severe
Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0742 Sex: Male Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 661

Microscopic Observations:

Liver	-Cytoplasmic vacuolization, moderate
	Microgranuloma, trace
Lung	-Alveolar histiocytosis, trace
Urinary Bladder	-Tissue Not Present

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Epididymis, Esophagus, Heart, Intestine, Kidney, Lymph Node, Nerve, Peripheral, Pancreas, Parathyroid, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Testis, Thymus, Thyroid, Tongue, Trachea.

Animal Number: 92.0773 Sex: Female Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 732

Microscopic Observations:

Parathyroid	-Not in plane of section

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine,

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Animal Number: 92.0773 Sex: Female Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 732

Microscopic Observations (continued):
The following tissues were found to be within normal limits (continued):
Kidney, Liver, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0774 Sex: Female Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 776

Microscopic Observations:

Liver	-Microgranuloma, trace
Parathyroid	-One of pair present
	Within Normal Limits

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0775 Sex: Female Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 774

Microscopic Observations:

Kidney	-Regeneration, tubular, mild
	Intratubular proteinic material, mild
Liver	-Cytoplasmic vacuolization, moderate
	Microgranuloma, trace
	Inflammation, subacute, portal, trace
Thyroid	-One of pair present
	Within Normal Limits
Uterus	-Hydrometra, moderate

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Parathyroid, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Tongue, Trachea, Urinary Bladder, Vagina.

Animal Number: 92.0776 Sex: Female Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 730

Microscopic Observations:

Liver	-Microgranuloma, trace
	Cytoplasmic vacuolization, mild
Parathyroid	-One of pair present
	Within Normal Limits

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0777 Sex: Female Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 751

Microscopic Observations:

Liver	-Cytoplasmic vacuolization, moderate
	Inflammation, subacute, portal, trace
Parathyroid	-One of pair present
	Within Normal Limits

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0778 Sex: Female Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 740

Microscopic Observations:

Adrenal Medulla	-One of pair present
	Within Normal Limits
Liver	-Microgranuloma, trace
	Cytoplasmic vacuolization, moderate
Parathyroid	-One of pair present
	Within Normal Limits
Uterus	-Hydrometra, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum,

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Animal Number: 92.0778 Sex: Female Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 740

Microscopic Observations (continued):
The following tissues were found to be within normal limits (continued):
Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder, Vagina.

Animal Number: 92.0779 Sex: Female Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 781

Microscopic Observations:

Aorta	-Tissue Not Present
Liver	-Microgranuloma, trace
	Cytoplasmic vacuolization, moderate
Parathyroid	-One of pair present
	Within Normal Limits
Thymus	-Hemorrhage, trace
Tongue	-One of pair present
	Within Normal Limits

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Eye, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thyroid, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0780 Sex: Female Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 794

Microscopic Observations:

Adrenal Medulla	-One of pair present
	Within Normal Limits
Liver	-Microgranuloma, trace
	Cytoplasmic vacuolization, moderate
Parathyroid	-Not in plane of section
Thymus	-Hemorrhage, trace
Thyroid	-Embryonic remnant

The following tissues were found to be within normal limits:
Adrenal Cortex, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum,

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Animal Number: 92.0780 Sex: Female Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 794

Microscopic Observations (continued):
The following tissues were found to be within normal limits (continued):
Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0781 Sex: Female Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 757

Microscopic Observations:

Liver	-Cytoplasmic vacuolization, moderate Microgranuloma, trace Inflammation, subacute, portal, trace
Parathyroid	-One of pair present Within Normal Limits
Thyroid	-Embryonic remnant

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0782 Sex: Female Group: (4) 1000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 750

Microscopic Observations:

Liver	-Cytoplasmic vacuolization, moderate Microgranuloma, trace
Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Parathyroid, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0743 Sex: Male Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 663

Microscopic Observations:

Epididymis	-Hypospermia, moderate
Heart	-Cardiomyopathy, mild
Kidney	-Regeneration, tubular, trace
Liver	-Necrosis, coagulative, focal, mild
	Cytoplasmic vacuolization, severe
	Inflammation, subacute, portal, trace
Testis	-Hypospermatogenesis, moderate

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Intestine, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Parathyroid, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0744 Sex: Male Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 678

Microscopic Observations:

Epididymis	-Hypospermia, severe
Heart	-Cardiomyopathy, mild
Kidney	-Hydronephrosis, moderate
Liver	-Microgranuloma, trace
	Inflammation, subacute, portal, trace
	Cytoplasmic vacuolization, severe
Parathyroid	-One of pair present
	Within Normal Limits
Testis	-Hypospermatogenesis, severe
	Granuloma, spermatic, mild

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Intestine, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0745 Sex: Male Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 634

Microscopic Observations:

Epididymis	-Hypospermia, severe
Heart	-Cardiomyopathy, mild
Intestine	-Within Normal Limits
	Only two sections of intestine present.
Kidney	-Regeneration, tubular, trace
	Intratubular proteinic material, trace
	Inflammation, interstitial, trace
Liver	-Microgranuloma, trace
	Cytoplasmic vacuolization, moderate
Prostate	-Inflammation, chronic active, severe
Testis	-Hypospermatogenesis, severe

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Parathyroid, Pituitary, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0746 Sex: Male Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 641

Microscopic Observations:

Aorta	-Tissue Not Present
Epididymis	-Hypospermia, severe
Heart	-Cardiomyopathy, mild
Kidney	-Hydronephrosis, moderate
	Intratubular proteinic material, trace
Liver	-Cytoplasmic vacuolization, moderate
	Inflammation, subacute, trace
	Microgranuloma, trace
Parathyroid	-Not in plane of section
Prostate	-Inflammation, subacute, mild
Testis	-Hypospermatogenesis, severe
Thyroid	-Embryonic remnant

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Intestine, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Salivary Gland, Seminal Vesicle,

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Animal Number: 92.0746 Sex: Male Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 641

Microscopic Observations (continued):
The following tissues were found to be within normal limits (continued):
Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0747 Sex: Male Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 690

Microscopic Observations:

Epididymis	-Hypospermia, severe
Heart	-Cardiomyopathy, trace
Kidney	-Regeneration, tubular, trace
Liver	-Cytoplasmic vacuolization, moderate Microgranuloma, trace
Parathyroid	-One of pair present Within Normal Limits
Testis	-Hypospermatogenesis, severe
Thymus	-Hemorrhage, trace
Thyroid	-Embryonic remnant

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Intestine, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0748 Sex: Male Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 649

Microscopic Observations:

Adrenal Medulla	-One of pair present Within Normal Limits
Epididymis	-Hypospermia, moderate Inflammation, subacute, trace
Heart	-Cardiomyopathy, trace
Liver	-Cytoplasmic vacuolization, moderate Inflammation, subacute, portal, mild
Parathyroid	-Not in plane of section
Pituitary	-Tissue Not Present
Testis	-Hypospermatogenesis, moderate
Thymus	-Hemorrhage, trace

Animal Number: 92.0748 Sex: Male Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 649

Microscopic Observations (continued):

Thyroid	-One of pair present Within Normal Limits

The following tissues were found to be within normal limits:
Adrenal Cortex, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0749 Sex: Male Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 679

Microscopic Observations:

Aorta	-Tissue Not Present
Brain, Cerebellum	-Tissue Not Present
Brain, Cerebrum	-Tissue Not Present
Brain, Medulla Oblongata	-Tissue Not Present
Brain, Midbrain	-Tissue Not Present
Brain, Pons	-Tissue Not Present
Epididymis	-One of pair present Hypospermia, moderate
General Comments	-Cassette #1 has three sections of intestine rather than brain.
Heart	-Cardiomyopathy, mild
Liver	-Cytoplasmic vacuolization, moderate Inflammation, subacute, portal, trace
Parathyroid	-One of pair present Within Normal Limits
Testis	-Hypospermatogenesis, moderate
Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Bone Marrow, Femur, Duodenum, Esophagus, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0750 Sex: Male Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 643

Microscopic Observations:

Aorta	-Tissue Not Present
Epididymis	-Hypospermia, moderate
Kidney	-Intratubular proteinic material, trace
	Regeneration, tubular, trace
Liver	-Cytoplasmic vacuolization, moderate
Pancreas	-Inflammation, subacute, mild
Testis	-Hypospermatogenesis, moderate

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Lung, Lymph Node, Nerve, Peripheral, Parathyroid, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0751 Sex: Male Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 675

Microscopic Observations:

Epididymis	-Hypospermia, moderate
Kidney	-Hemorrhage, severe
	Intratubular proteinic material, trace
	Necrosis, severe
Liver	-Cytoplasmic vacuolization, moderate
	Inflammation, subacute, portal, trace
Lung	-Alveolar histiocytosis, trace
Parathyroid	-One of pair present
	Within Normal Limits
Spleen	-Inflammation, subacute, capsular, moderate
Testis	-Hypospermatogenesis, severe

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Lymph Node, Nerve, Peripheral, Pancreas, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0752 Sex: Male Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 632

Microscopic Observations:

Adrenal Medulla	-One of pair present
	Within Normal Limits
Epididymis	-Hypospermia, severe
	Granuloma, spermatic, moderate
Heart	-Cardiomyopathy, mild
Liver	-Cytoplasmic vacuolization, moderate
	Microgranuloma, trace
Testis	-Hypospermatogenesis, severe

The following tissues were found to be within normal limits:
Adrenal Cortex, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Pancreas, Parathyroid, Pituitary, Prostate, Salivary Gland, Seminal Vesicle, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder.

Animal Number: 92.0783 Sex: Female Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 768

Microscopic Observations:

Aorta	-Tissue Not Present
Liver	-Microgranuloma, trace
	Cytoplasmic vacuolization, moderate
Parathyroid	-One of pair present
	Within Normal Limits
Skin	-Tissue Not Present

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0784 Sex: Female Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 761

Microscopic Observations:

Liver	-Cytoplasmic vacuolization, moderate
	Microgranuloma, trace
Lung	-Alveolar histiocytosis, trace
Thyroid	-Embryonic remnant
Urinary Bladder	-Tissue Not Present
Uterus	-Tissue Not Present
Vagina	-Tissue Not Present

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Parathyroid, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Tongue, Trachea.

Animal Number: 92.0785 Sex: Female Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 784

Microscopic Observations:

Adrenal Cortex	-One of pair present
	Within Normal Limits
Adrenal Medulla	-One of pair present
	Within Normal Limits
Liver	-Cytoplasmic vacuolization, moderate
	Microgranuloma, trace
Lung	-Alveolar histiocytosis, trace
Parathyroid	-One of pair present
	Within Normal Limits
Thymus	-Hemorrhage, trace
Thyroid	-One of pair present
	Within Normal Limits

The following tissues were found to be within normal limits:
Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0786 Sex: Female Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 771

Microscopic Observations:

Adrenal Medulla	-One of pair present Within Normal Limits
Liver	-Cytoplasmic vacuolization, moderate Microgranuloma, trace
Lymph Node	-Sequestered blood, mild
Thymus	-Hemorrhage, trace
Uterus	-Hydrometra, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Nerve, Peripheral, Ovary, Pancreas, Parathyroid, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thyroid, Tongue, Trachea, Urinary Bladder, Vagina.

Animal Number: 92.0787 Sex: Female Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 778

Microscopic Observations:

Liver	-Cytoplasmic vacuolization, mild
Lung	-Hemorrhage, trace
Parathyroid	-One of pair present Within Normal Limits

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0788 Sex: Female Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 725

Microscopic Observations:

Adrenal Medulla	-One of pair present Within Normal Limits
Liver	-Microgranuloma, trace Cytoplasmic vacuolization, mild
Parathyroid	-One of pair present Within Normal Limits

Animal Number: 92.0788 Sex: Female Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 725

Microscopic Observations (continued):

Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0789 Sex: Female Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 715

Microscopic Observations:

Adrenal Medulla	-One of pair present Within Normal Limits
Liver	-Cytoplasmic vacuolization, moderate Microgranuloma, trace Inflammation, subacute, portal, trace
Pituitary	-Tissue Not Present
Thymus	-Hemorrhage, trace

The following tissues were found to be within normal limits:
Adrenal Cortex, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Parathyroid, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0790 Sex: Female Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 727

Microscopic Observations:

Kidney	-Intratubular proteinic material, mild Regeneration, tubular, mild
Liver	-Microgranuloma, trace Inflammation, subacute, portal, trace Cytoplasmic vacuolization, severe
Parathyroid	-Not in plane of section
Stomach, Glandular	-Mineralization, moderate

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum,

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Animal Number: 92.0790 Sex: Female Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 727

Microscopic Observations (continued):
The following tissues were found to be within normal limits (continued):
Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Nonglandular, Thymus, Thyroid, Tongue, Trachea, Urinary Bladder, Uterus, Vagina.

Animal Number: 92.0791 Sex: Female Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 736

Microscopic Observations:

Liver	-Microgranuloma, trace
	Cytoplasmic vacuolization, severe
Parathyroid	-Not in plane of section
Thyroid	-One of pair present
	Within Normal Limits
Urinary Bladder	-Tissue Not Present
Uterus	-Hydrometra, mild

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum, Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Kidney, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Thymus, Tongue, Trachea, Vagina.

Animal Number: 92.0792 Sex: Female Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 714

Microscopic Observations:

Kidney	-Regeneration, tubular, trace
Liver	-Cytoplasmic vacuolization, moderate
	Microgranuloma, trace
Parathyroid	-One of pair present
	Within Normal Limits
Thymus	-Hemorrhage, trace
Thyroid	-Embryonic remnant
Urinary Bladder	-Tissue Not Present

The following tissues were found to be within normal limits:
Adrenal Cortex, Adrenal Medulla, Aorta, Bone Marrow, Femur, Brain, Cerebellum, Brain, Cerebrum,

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Animal Number: 92.0792 Sex: Female Group: (5) 2000 PPM
Fate: (Day= 90) Scheduled Euthanasia Printed on 06-09-1993. Accession Number: 714

Microscopic Observations (continued):
The following tissues were found to be within normal limits (continued):
Brain, Medulla Oblongata, Brain, Midbrain, Brain, Pons, Duodenum, Esophagus, Heart, Intestine, Lung, Lymph Node, Nerve, Peripheral, Ovary, Pancreas, Pituitary, Salivary Gland, Skeletal Muscle, Skin, Spinal Cord, Spleen, Stomach, Glandular, Stomach, Nonglandular, Tongue, Trachea, Uterus, Vagina.

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Mrs. Pat Beall
US Army Environmental Hygiene Agency
Tox Division, Bldg E-2100
Aberdeen Proving Ground, MD 21010-5422

June 10, 1993

Dear Mrs. Beall:

Enclosed are two copies of the pathology report, microslides, paraffin blocks, and histology processing records from 100 rats from the 90-day feeding study of 4-amino, 2-nitrotoluene.

The report is signed, and can be considered a final report if there are no revisions. If there are any revisions, this version will be considered as a draft report.

Sincerely yours,

G. A. Parker

George A. Parker, DVM